AUGUST 1951

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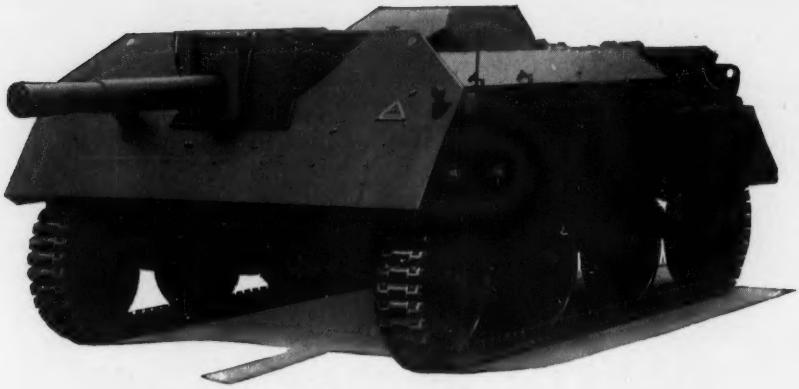

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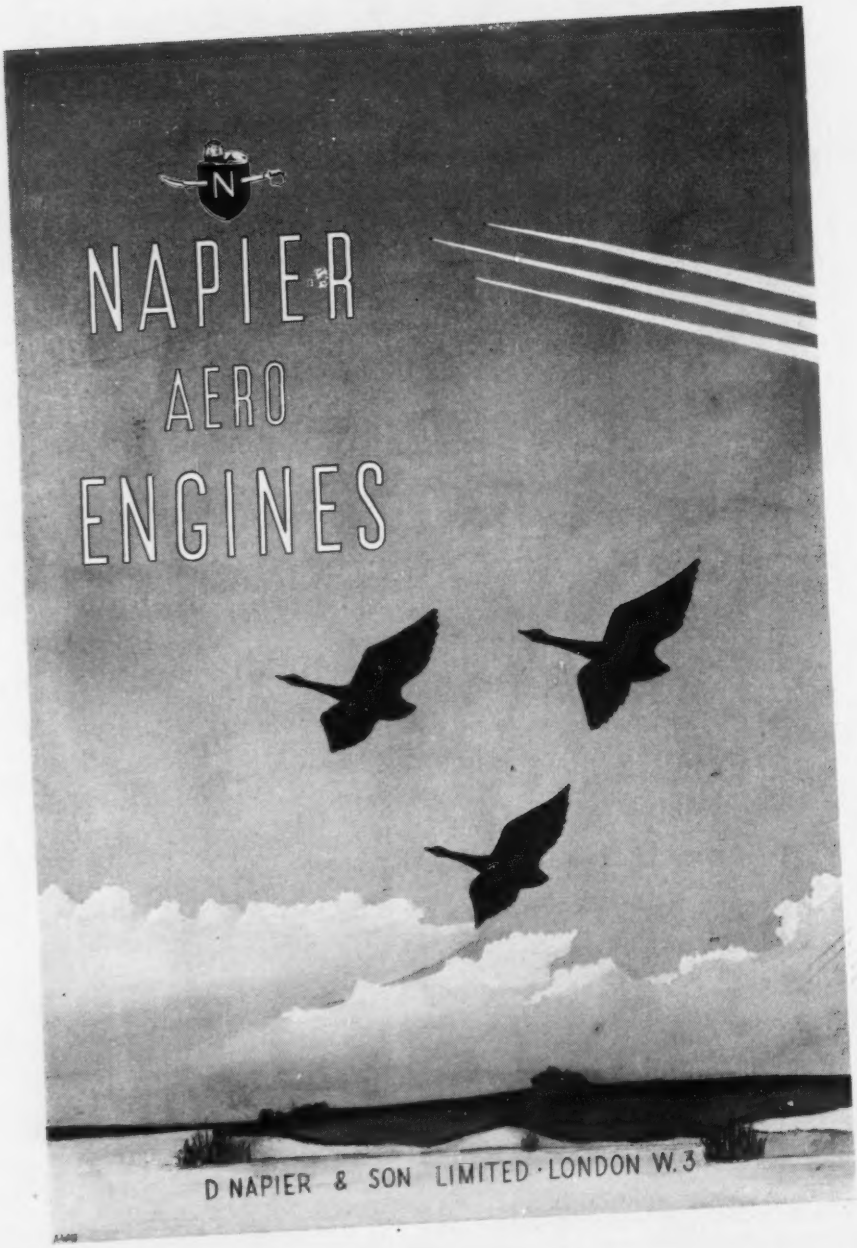
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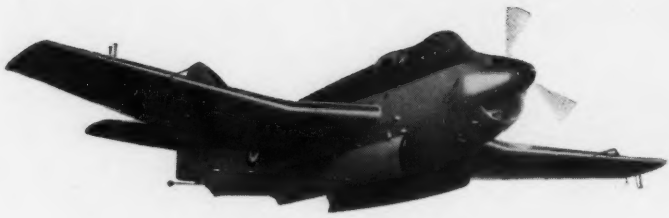
CONTENTS

AUGUST, 1951

	Page
Secretary's Notes	xi
Frontispiece : The Rubens Ceiling—North and South Centre Panels.	
Steel Supplies in War (*Lecture*). By Mr. Stanley W. Rawson	373
The Development of Propulsive Machinery for Surface and Submarine Warships (*Lecture*). By Captain (E) C. P. Gallimore, R.N.	385
The Campaign Against the Terrorists in Malaya (*Lecture*). By Air Vice-Marshal Sir Francis Mellersh, K.B.E., A.F.C.	401
The War in the Pacific, 1944. Leyte Island and Mindoro. By Lieut.-Colonel H. E. Fooks, O.B.E.	416
The Meaning of Military Uniforms (*Lecture*). By Mr. James Laver, C.B.E.	425
Pax Atlantica. By J. M. Spaight, C.B., C.B.E.	434
Army in Africa. By Brigadier F. A. S. Clarke, D.S.O.	440
A Noteworthy Piece of Bluff. By Admiral R. Bax, C.B.	446
Tank Policy. By Lieut.-General Sir Giffard Martel, K.C.B., K.B.E., D.S.O., M.C.	448
Tanks and Infantry—The Need for Speed. By Lieut.-Colonel R. M. P. Carver, C.B.E., D.S.O., M.C.	452
Mobile Air Forces. By Air Marshal Sir Thomas Elmhirst, K.B.E., C.B., A.F.C.	457
The Building of a Reserve Base. By Major-General D. A. L. Wade, C.B., O.B.E., M.C., B.A., A.M.I.E.E.	462
The Place of Regimental Associations in the Present Brigade Group Organization. By "Noll"	470
Diary of the War in Korea	474
The International Situation. By A. K. Chesterton, M.C. :—	
(i) Towards a Japanese Peace Treaty	482
(ii) Korean Hopes and Snares	482
(iii) Russian Strength and Weakness	483
(iv) Germany the Key	484
(v) The Persian Oil Problem	485
Correspondence	486
General Service Notes	489
Navy Notes	501
Army Notes	513
Air Notes	521
Reviews of Books	530
Additions to Library	540

NOTE

Authors alone are responsible for the contents of their respective papers.



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August, 1951.

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Ex-Officio Members

Air Vice-Marshal A. D. Gillmore, C.B.E., has accepted the invitation of the Council to become an ex-officio Member of the Council on taking up the appointment of Commandant of the Royal Air Force Staff College.

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The following officers joined the Institution between 1st May and 31st July, 1951 :—

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ARMY

Captain A. G. Burnaby-Atkins, M.C., The King's Royal Rifle Corps.
Captain Lord Brabourne, late Coldstream Guards.
Captain J. E. Leigh, late 2nd West Lancs. Brigade., R.F.A.
Major E. Robson, M.A., late K.O.Y.L.I.
Lieut.-Colonel H. J. Tedder, O.B.E., The Royal Warwickshire Regiment.
Lieutenant R. MacD. Esden, Royal Artillery.
Captain A. Soutar, The Somerset Light Infantry.
Captain A. H. Thrift, M.C., Royal Tank Regiment.
Captain A. A. G. Anderson, Royal Signals.
Lieutenant W. D. Fairholme, late Welsh Guards.
Captain R. S. Garrett, late The Sherwood Foresters.
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Colonel A. N. T. Meneces, C.B.E., D.S.O., M.D., M.R.C.P., R.A.M.C.
Captain C. E. Quekett, 11th Hussars.
Lieut.-Colonel B. Read Taylor, M.C., late The South Staffordshire Regiment.
Colonel A. H. McCleverty, late Indian Army.
Major T. D. Khan Ghazi, 8th Punjab Regiment, P.A.
Major Narindar Singh, 8th Light Cavalry, I.A.
Major G. H. Lea, The Lancashire Fusiliers.
Major H. Whitbread, T.D., The King's Royal Rifle Corps.
Lieut.-Colonel Mohd. Shafee Chaudhi, Pakistan Signals.
Lieut.-Colonel Syed Abid Ali Bilgrami, 12th F.F. Regiment, P.A.
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Captain S. J. Lewis, R.A.O.C.
Captain A. G. Jelley, The Dorset Regiment.
Major-General Lord Ruthven, C.B., C.M.G., D.S.O., D.L., late Scots Guards.
Lieut.-Colonel Amreek Singh, Regiment of Artillery, I.A.
Major H. M. G. Baillie, late Intelligence Corps.

Captain G. R. Ferguson, late R.A.D.C.
Lieutenant A. St. H. Aubrey, late 6th Derbyshire Bn. Home Guard.
Major M. Nasir Beg, 1st Punjab Regiment, P.A.
Lieut.-Colonel P. L. Binns, late The East Yorkshire Regiment (Duke of York's Own).
Major H. Hullock, late Indian Army.
Colonel B. C. Judd, O.B.E., late South African Artillery.

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Flying Officer J. Weedon, R.A.F.
Flying Officer J. H. Bone, R.A.F. Regiment.
Squadron Leader J. A. R. M. Reid, R.A.F.
Squadron Leader B. W. Parsons, A.F.C., R.A.F.
Wing Commander B. Barthold, R.A.F.
Squadron Leader R. G. Reid, R.A.F.
Flight Lieutenant W. H. Hulin, R.A.F.

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Southern Command	Vacant
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Coastal Command...	... ...	Squadron Leader B. W. Parsons, A.F.C., R.A.F.
Headquarters, British Air Forces of Occupation	... ...	Wing Commander C. S. W. Harte, R.A.F.

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The temporary Exhibition in the Theatre will be closed at the end of August, in preparation for the Lecture Session.

Additions

A large silver tray inscribed: "Presented by the Patriotic Fund to Sir Edward Pellew in testimony of their sense of his gallant conduct in the capture of the 'Cleopatra,' French Frigate, on 19th June, 1793" (3708). Lent by the Viscount Exmouth.

A 75 m.m. shell of Japanese manufacture which penetrated and lodged in H.M.S. "Amethyst" when she was under fire from Chinese Communists, April-July 1949 (3709). Lent by Commander J. S. Kerans, D.S.O., R.N.

Two coffee urns reputed to have been found in the baggage of the Emperor Napoleon on the field of Waterloo (3711-3712). Lent by Mrs. M. Alder.

A water colour painting of a drum-major of the Royal Marines, by Adolphe, 1854 (3718). Lent by Lieut.-Colonel R. J. T. Hills.

The Colour of a second captain, regiment of foot, reputed to have been carried during the Monmouth Rebellion of 1685 (9512). Given by Mrs. M. M. Currall.

Model of H.M.S. "Illustrious," aircraft carrier, 23,000 tons. Scale 1 in.-16 ft. Constructed by Norman A. Ough, assisted by Francis Gill (9513).

Photograph of the painting of H.M.S. "Sirius," Australia's first flagship, by John Allcot, 1924 (9514). Given by Mrs. E. Dunne.

Photograph of the painting of H.M.S. "Endeavour," by John Allcot, 1924 (9515). Given by Mrs. E. Dunne.

Photograph of the painting of H.M.S. "Roebuck," by John Allcot, 1924 (9516). Given by Mrs. E. Dunne.

Line drawing of the hull of H.M.S. "Neptune," engraved by J. L. Propert, 1876 (9517). Given by Mrs. E. Dunne.

A small oil painting of an officer of the Madras Light Cavalry, 1845 (9518). Given by Major P. Young, D.S.O., M.C.

A snuff box reputed to have been made for Field-Marshal Lord Raglan by A. Wormull (9519). Given by Mrs. M. Wilkinson.

A coloured print from an engraving entitled "Privy Gardens," published by T. Malton in 1794 (9520).

A coloured print from an engraving entitled "White Hall," published by T. Malton in 1794 (9521).

Full dress uniform of a trooper of The City of London Imperial Yeomanry (Rough Riders), 1914 (9522). Given by Mr. St. John Hope.

JOURNAL

Offers of suitable contributions to the Journal are invited. Confidential matter cannot be used, but there is ample scope for professional articles which contain useful lessons of the War; also contributions of a general Service character, such as Strategic Principles, Command and Leadership, Morale, Staff Work, Naval, Military and Air Force History, Customs and Traditions.

The Editor is authorized to receive articles from serving officers and, if found suitable, to seek permission for their publication from the appropriate Service Department.

Army officers are reminded that such articles must be accompanied by the written approval of the author's Commanding Officer.

LIBRARY

The Institution possesses only one set of *The Mariner's Mirror* and this is reserved for reference in the Library.

If any Member has back numbers which he would be willing to present to the Library, he should kindly communicate with the Librarian.

CHANGES OF ADDRESS

Members are particularly requested to notify any change of address which will affect the dispatch of the JOURNAL.

Naval Officers are strongly advised to keep the Institution informed of their address, as JOURNALS sent to them via C. W. Branch of the Admiralty are invariably greatly delayed.

CHRISTMAS CARDS

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THE RUBENS CEILING

Painted by Rubens for the Ceiling of the Banqueting
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THE JOURNAL

of the

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STEEL SUPPLIES IN WAR

By Mr. Stanley W. Rawson

On Wednesday, 21st March, 1951, at 3 p.m.

Sir Graham Cunningham, K.B.E., LL.B., in the Chair

The Chairman: It is not necessary for me to introduce Mr. Rawson. You know that he is going to speak about "Steel Supplies in War."

There is just one thing I want to say. I have had some experience of supplies of steel and munitions and other articles in war-time as Chief Executive of the Ministry of Supply for a period of about five years in the recent war. Only towards the end of it did I realise that the Country would have been better served—or so I believe—if those who were responsible for supply had had a far closer knowledge throughout the War right from the very beginning of what the operational General Staff was doing and was contemplating doing. In other words, I believe that in a future war the General Staff at the War Office would be well advised to see that those at the head of the Ministry of Supply were taken into their counsels, so that the supply officers knew what was being planned, possibly years beforehand, and what munitions would be required for the operation. So often the General Staff, when they wanted to do an operation, did not realise the time it took to tool up and prepare and supply weapons of war for that very operation. It is evident that those who are, or may be, responsible for war operations, whatever form they may take, should know all the problems of those responsible for production. Before production, however, comes the supply of raw materials. I do not know what Mr. Rawson is going to say, but I believe you will benefit very considerably from hearing about the problems of which he will tell you, because they are absolutely vital. It is essential that they should be understood before any General goes into the field to-day.

You might think that that is a far call, but it is in fact a very near call. The experience of the recent war has shown us that the problems of production must be understood by the Higher Command before they plan military operations. The two are closely integrated.

Mr. Rawson is connected with so many companies that I hesitate to tell you what they are. You know that he is Managing Director of John Brown's who, amongst other things, produced the "Queen Mary" and the "Queen Elizabeth" and whose yards I have visited. He is connected with steel companies of all kinds. With his vast experience he has now taken a job in connection with the supply of machine tools for the War Office at the Ministry of Supply.

It is often asked how in the name of fortune a man who is so busy can take on additional work, but we all know that it is always the busy man who can take on extra responsibilities. It is the man with very little to do who has no time to do it. Mr. Rawson, with all his responsibilities, has taken on that job. I have deliberately not congratulated him on his appointment. I feel we ought to commiserate with him. We ought to thank him for assuming additional responsibilities when he has already so many on his shoulders. However, it is not for me to keep you any longer, and I will ask Mr. Rawson to address you.

LECTURE

FIRST of all, I must thank Sir Graham Cunningham for his very kind introduction of a very modest person. Some months ago, when General Lyne asked me whether I would be prepared to address this distinguished Institution on such a knotty problem as steel supplies, I had many misgivings. And when I found what sort of problem I had undertaken to tell you about, I had even more. But by that time I had burned my boats, and therefore I must ask for your indulgence. I knew the subject was a vast one, but I did not realise how vast it was until I tried to pursue it into its own four corners.

Up to about the 1914–18 War, steel was something that just happened. But with the advent of that war we got, for the first time, what has been described as "A People under Arms." But the modern conception of war is a great deal more than "A People under Arms." Everything a Country or a State possesses is at the disposal of the State for the purposes of war, because modern war is not merely a struggle for victory. The struggle imposes one policy rather than another. It is a struggle for survival and, with all one's shortcomings, one has to look beyond military survival and to consider every means one has at one's disposal.

Steel production and steel consumption, both absolutely and per head of population, take their place in the calculation of available means as indices of industrial power. Other things being equal, industrial power will win. The proviso is an important one. Not long ago an important Minister referred to the large excess of steel production available to the Western Powers as decisive proof of the ultimate military superiority of the Western Powers. It does not amount to more than a strong probability of success. However great resources may be, they only present the possibility that they will be mobilized in the right time and in the right place.

Steel is, and will no doubt long remain, that material which is at once strong and of minimum mass, available in quantity and at a reasonable cost. Moreover, it is durable and its loss of physical strength is in general spread over a long time and does not occur suddenly. It can be shaped in a variety of ways. It is inherently elastic and can be made tough and shock resisting. In war it has a two-fold part to play. First, it is the indispensable material of all modern industrial equipment and of all the appurtenances of modern life. Secondly, it is the material from which is fabricated practically every weapon used in offence or defence, and of the means and services by which those weapons are brought to bear, and makes the preservation of the lives of their bearers more likely. These two roles are quite distinct from each other.

Steel Production

Let us look for a moment at what I have called the first role of steel in war. I am afraid that here I must introduce some statistics. In 1937, Great Britain produced, in round figures, 11,500,000 tons of steel ingots a year; in 1950, production was not far short of 16,000,000 tons. In each year she had also at her disposal about another 2½ to 3 million tons in the form of semi-finished and finished steel. In the U.S.A. the corresponding figures are upwards of 50,000,000 tons in 1937, and between 80,000,000 and 90,000,000 tons in 1950. I should like to illustrate what these large figures mean by referring to some statistics published a few months ago by Dorman Long & Co., Ltd., whom you probably know as one of the largest producers of structural and mild steels in Great Britain. These figures give a good cross section of a modern integrated works. They cover a period of four weeks only. The production of steel ingots was 128,419 tons, to the making of which went 97,200 tons

of pig-iron and 54,813 tons of steel scrap. The ingots were rolled into 102,000 tons of rolled steel—joists, angles, plates, and bars—302,326 tons of iron ore were used, and 218,036 tons of coal and coke ; 172,000 tons of slag and ballast had to be removed and tipped. Thus a million tons of rough, heavy material had to be handled. This is not all. Nine hundred million cubic feet of coke oven gas and 9,234 million cubic feet of blast furnace gas went into fire furnaces to raise steam for power. Moreover, 2,464 million gallons of water and 20 million kilowatts of electricity were used—far more than the power consumption of many a County Borough.

What this implies is the important thing. It implies the power to bring together and to handle masses of crude and heavy material ; the existence and functioning of large public services providing transport, power, gas, and water ; and the ability to train, control, and direct the work of numbers of men and to marshal their skill and strength. It implies the metallurgical skill and knowledge to devise and operate, and the engineering resources to design, erect, and maintain heavy appliances and powerful mechanical aids.

Contrary to what is generally supposed, steel is not produced " in the blue." It is produced in the particular form, in the particular quality, size, and shape needed by the user. There has, of course, been an immense amount of standardization so as to produce the best combination of strength for weight which is practicable ; but steel production on this scale involves the existence of complex consuming industries, which fashion and shape the products of the steel furnace, forge, and rolling mill to build ships, power houses, factories, wharves, railways, and the other appurtenances of an industrialized mode of living.

Concentration of the Industry

This part of the steel industry consists in large and complex units of plant grouped in great concentrations for converting iron stone and iron ore, by the use of heat, into iron and steel. The industry has indeed not unfairly been described as a problem in " burning coal and shifting muck." It cannot function without a steady and uninterrupted flow of bulky materials ; and the mining, transport, conversion, and shaping of these bulky masses must be carried on continuously and without serious breaks. Considerations of heat economy have brought about greater and greater concentration of the melting side of iron and steel production. Massive mechanical equipment for the discharge, handling, and distribution of coal, coke, ore, and limestone is only economical if throughput is large and continuous. The size of blast furnaces has increased from a capacity of about 800–1,000 tons per week 30 years ago to 800–1,000 tons per day in terms of melted iron output.

The blast furnace is an enormous producer of low grade heat, far in excess of its own requirements. If the steel furnaces using its metal are to produce a uniform and clean steel, the metal from the blast furnace must be kept uniform in character and quality. This means careful grading of the size and quality of the iron ore used, screening plant, and plant to enrich or modify iron ore of low quality or unsuitable size. Regularity in diet is the essential need of the blast furnace.

Problems of Defence

This degree of concentration has been brought about over a number of years. From a military point of view it presents problems particularly of aerial defence as regards the plants themselves. Dispersal of production is quite impracticable, the detailed lay-out and situation of the main plants of the World are perfectly well known.

It was always a matter of surprise to many engaged in the iron and steel industry that aerial attack upon blast furnace plants was never seriously pressed, while many lives were lost in destroying fabricating and engineering plant, which is relatively much easier of replacement. A single blast furnace out of action will mean each year from 100,000 tons to 350,000 tons of pig-iron; up to twice as much crude steel is eliminated as raw material; it might mean laying up half a million tons a year of production and, under war-time conditions, replacement would take two-and-a-half years at least. The higher the concentration of steel production, the more paying are the targets offered and the better the prospect of cutting off steel at its source.

There is another aspect of steel production and supply which must come into strategic calculations. Notwithstanding the development of mechanical aids, much of the work in steel plants is both hot and heavy, calling for sound physical stamina and a capacity for applied rhythmic group working which can only come from careful training and experienced habit. Taken as a whole, direct employment in the industry in this Country is about 500,000, of whom by far the larger part are able-bodied men. There are, of course, employed in mining and transport for the service of the industry, at least as many more again.

In time of war, there is an immediate demand for the maximum possible production, in order to economise on imports from overseas, to provide materials for the economy of war, and to contribute to the maintenance of civilian services. From this very fact flows a number of awkward consequences. Coal, iron, and steel centres have in general very few alternative industries, especially light industries suitable for female labour. It is a matter of history and a good many efforts have been made in the last 15 years to overcome it. To the planner of war-time industry, the women population of these centres is a heaven sent opportunity for recruitment. "Munitions work" is generally overpaid; its rates are based upon piece-rates, fixed under wholly different conditions. On the other hand, the men who must remain in their existing occupations, remote, in their minds, from the very weapons in the production of which their wives and daughters are more directly engaged, feel frustrated and resentful. They feel themselves denied the opportunity of earning "big money," not for the sake of the money itself, but to be able to show what they can do. There are, of course, minor social consequences, of which not the least is the altered status in a household of the former "breadwinner", which deserve most serious study. That has meant a sense of frustration which is a very serious factor in psychological warfare.

The Psychology of Output

The rather rough and ready form of applied psychology which comes, quite wrongly, under the head of propaganda, deserves far more attention in relation to iron and steel than it has yet received. During the 1939–45 War, and ever since, insistence upon maximum output created, and still creates, a number of embarrassing shortages. In no industry are the maximum and optimum output necessarily the same. For instance, a plate rolling mill may be able to roll plates for shipbuilding and construction work varying, let us say from $\frac{3}{8}$ in. thick up to $2\frac{1}{2}$ in. or more. At the top end of the range, the weight of plate which can be rolled in one shift is limited by the larger number of slabs to be handled; at the bottom end of the range the thinner the plate, the longer the time required to roll it and the more in number of plates must be handled. The largest tonnage output in a working period of such a mill is probably in the range of 1 in. to $1\frac{1}{4}$ in. thickness. If weight of output alone is the standard of attainment, any plates outside these limits get neglected; they

are either too heavy or too light for the output of the mill; and are unwelcome intruders. They cut down the tonnage; they cut down earnings; and thus are created a number of those "shortages" or "bottlenecks," which should not, of course, occur. One of them is almost endemic in steel supplies, since development in a particular direction coincides with what may be called the tonnage outlook. There is a gap in production capacity in the field of dimensions between a sheet and a plate, thicknesses between say an $\frac{1}{8}$ in. and $\frac{3}{16}$ in. where the advance of welded construction has outpaced the visible supply. This in its way explains a great many of the difficulties in building destroyers and railway wagons, and in welding work which is now replacing other methods.

The feature I have just referred to, while it does lead to difficulty in the supply of fringe products through, perhaps, over emphasis on quantity, also leads to the elimination of unnecessary refinements and to greater acceptance of standard products. The history of the modern heavy steel industry is the story of successive stages in the production from relatively poor materials of a product a little stronger than, and as homogeneous as, first-class wrought-iron. For over 50 years structural design has been founded upon low carbon steels with a breaking strength of from 28 to 32 tons per square inch and an elastic limit of about 18 tons per square inch. Progress has lain in the growing confidence that the designer can expect in the uniformity of his material; and from the knowledge that the physical tests applied to a tiny fraction of the material do, in fact, represent the actual state of the steel. This is no mean advance, and it has meant the progressive lightening of every type of engineering structure, the ability to build larger installations, to span much greater widths. The credit for the greater part of this enormous advance belongs exclusively to Great Britain. Sir Henry Bessemer first made steel in reasonable quantity in the air blown converter, and the Gilchrist-Thomas process made it possible to produce steel from phosphorous iron ore, of which nine-tenths or more of the World's iron ores consist. Great Britain, too, was the home of the independent consulting engineer, to whose careful working out of the loads to be carried and the effect, both in the long and short term, of design stresses, the British steel industry is deeply indebted. British standards of steel specification have been evolved mainly from the standpoint of what is it proper to use; not what is it convenient to make. That is a very important distinction, because the German and American industry dictated standards, not the users.

British steel practice has often been accused of over-great conservatism. Steel, whether in war or peace, is the material from which are constructed many structures used by innumerable members of the public, and of which the collapse may lead to serious disaster. The Common Law and Statute Law impose a sense of responsibility upon designers and manufacturers alike which does not exist in most industrialized countries. In recent years the technical value of the mild steels has been notably enhanced by the development of the use of sheet and strip. Pressing and folding of sheet and strip, and the enormously increased use of tubes, have given to steel of thin section that rigidity of form which hitherto had been a severe limit to weight reduction.

THE SPECIAL STEEL INDUSTRY

Let me turn to that part of iron and steel production directly concerned with the making of weapons, namely, the special steel industry. This industry plays the part which in former days was the function of the swordsmith and the armourer. Special steels account for in peace-time about 600,000 tons and in war-time at most

1,000,000 tons a year out of the 15 or 16 million tons of ingots produced in Great Britain. But it is upon this comparatively insignificant amount that is based advanced engineering design. In 1897, an Otto gas engine, driving a small generator, weighed about a ton and a half per horsepower; a modern internal combustion turbine weighs under $\frac{1}{10}$ lb. per horsepower. In 53 years we have gone so far and the advance is mainly a matter of metallurgy and the materials it has created.

Modern High-duty Steels

Fine steels have always been known; mostly for making knives and swords, body armour, and, later, gun locks and barrels. They were probably made by carbonising iron bars, followed by prolonged hammering both in the hot and cold state. It has to be very highly tempered and old swords one has seen in museums may have taken the swordsmith two or three years hammering to make. But the modern special steels are the response to engineering needs. Cast-iron and brass had to be cut and shaped; iron forgings and bars had to be formed into machine parts. Designers and builders of steam engines and pumps wanted more power out of the same dimensions or equal power out of smaller dimensions. Moving parts had to be, at the same time, lightened and strengthened, and made resistant to shock, to wear, and to fatigue. Special steels were for many years melted in closed fire-clay crucibles heated in coke-fired furnaces. The materials were carefully selected Swedish "blister" steel bars, made by treating pure iron bars with layers of bone ash. The material, when melted, was carefully poured into heated moulds and allowed to cool slowly. What modern practice does is to repeat, but on a larger scale, the careful and exact methods of these early steel men. A good many problems have come from not following what was done perhaps a century ago. Shortly before the 1914 War, the electric arc furnace and, later, the high-frequency furnace, followed. In both, steel could be melted without contamination with the impurities, particularly sulphur, present in greater or less degree in every form of coal gas.

The development of the high-speed steels was immensely stimulated by the studies of F. W. Taylor, who made it his mission to speed up accurate machining. Simultaneously with the development of high-speed steels came the high duty alloy structural steels. Much had been learned of the effect upon the hardness, toughness, and shock resistance of steels of admixtures of small quantities of nickel, chrome, molybdenum, and vanadium, and from efforts to improve ship-armour, naval guns, and armour-piercing shell. In some cases, alloy admixtures only offered a more certain and often a cheaper way of arriving at the same result. Manufacturing risks were less and uniformity of results was more easily attained. The development of the petrol engine in its turn brought a new demand for strong reliable steels.

Problems of Production

The 1914–18 War gave a tremendous impetus to metallurgical progress. Up to that time most of the alloy steel specifications were carefully preserved trade secrets, hidden behind a bewildering variety of brand names and trademarks. In some cases they were protected by patents where patent practice did not require a full enough disclosure to enable trade rivals to copy them. The 1914–18 War demonstrated that the sort of steel supplies you get in war depends entirely upon the sort of war you have to fight. On land there was the massive development of fire-power; the deployment of thousands of light, medium, and heavy field guns with their insatiable demand for shells; the call for myriads of small arms and small arms ammunition;

grenades and field engineering equipment; and, in the later stages, the accelerated development of the aero-engine and the tank. Each of these presented its own problems of metallurgy and production, and in each field there had to be learned the lesson that, in war, what is needed is not the best but that which will just do. High explosive shell needs a steel strong enough not to set up an explosion in the gun under the shock of the propellant, and at the same time a thin enough cylinder wall to allow the loading in the shell of an adequate explosive charge. The quantity of steel needed for land shells was far beyond the capacity of the special steel makers and the aid of the heavy steel makers was enlisted. There was stern resistance to the use of basic steel until it was discovered that the shells of the 77 mm. German field gun and the 5.9 howitzer were of basic Bessemer steel and that the French authorities gladly used, for the French 75 mm. gun, bars rejected as unsuitable in Great Britain. The caution, however, was not misplaced. The technique of producing rolled round bars to accurate dimensions in a steel of uniform properties had a stimulating effect upon the general level of furnace and mill efficiency; and the British Artillery suffered few of those disasters to morale which come from burst breeches and barrels.

Large forces call for a large number of weapons and instruments, each as nearly as possible identical with the other. Small arms and small arms ammunition, fuses, and breech mechanisms offered a field for repetition design and production never before afforded to Great Britain. Repetition production—that is, the production of a series of uniformly identical parts—is only practicable if machines, cutting tools, and material cut are uniform. When you recall that steel is an artifact, a solid solution resulting from the process of freezing, a molten mass smelted down from crude materials whose chemical structure is only approximately known, you can gauge how important for war service is the technique of producing uniformity of endurance and performance.

The New Problems

The War of 1939–45 presented a series of new problems, the same in kind but different in degree. The early expectation of massive infantry and artillery battles was not fulfilled, but at an early stage appeared the problem of repetition production of fighting aircraft, especially engines, propellors, and armament. The aero-engine designer wants every ounce of power he can get; any superfluous weight is an unnecessary loss of power and no allowance can be made for the factor of ignorance. At the same time, a very slight margin of superiority over the enemy may very well be decisive, though if the limit of safety is passed and the fighting man is conscious that his engine may crack up in the air, the psychological result may be disastrous. The margin of safety may be desperately narrow, but it must be there.

It is noteworthy that the chief aero-engine which powered British fighters began the War with a rating of 650 h.p. and finished with a normal rating of three times that power on the same dimensions. The use of the 20 mm. cannon in aircraft, and of the 40 mm. anti-aircraft gun, was considerably delayed by the lack of a suitable spring steel until the chrome-vanadium steels were developed and the lesson was learned how important is surface finish when material is stressed nearly to its theoretical limit. It is, I think, a striking tribute to British technique, both of steel makers and designers alike, when I tell you that in materials for critical parts of aero-engines, rejections were less than two per cent. of what was produced.

Vulnerability and Dispersion

The 1939–45 War brought with it the prospect of serious aerial attack and the special steel industry was peculiarly vulnerable, since 95 per cent. of the production

was concentrated in the narrow valley running East-North-East from Sheffield. Measures were at once taken for the dispersal of the industry. The principal makers acted as leader firms and undertook the technical tuition of steel makers in other parts of the country. Electric furnaces were erected where suitable rolling mills were to be found, and open-hearth furnaces were adapted to alloy steel production. It was expected that, in the event of the main plants being disabled, working personnel could be quickly transferred. At the same time the efforts of the leading metallurgists were directed to the task of "rationalising" the many varieties of carbon and alloy steels used for high duty engineering purposes, both to make production simpler and to prevent the waste of valuable strategic alloys by using steel more highly alloyed than was justified by the mechanical properties required in a particular mechanical part. The great range of the E.N. steels was the work principally of the late Dr. W. H. Hatfield, Dr. E. Burton, of the English Steel Corporation, and Dr. T. E. Swinden, of the United Steel Company, and it was these steels, upon which their American counterparts were founded, which made possible that mass of swift moving, hard hitting vehicles, and their colossal supply train by which the Continent was invaded, Germany overrun, and the Japanese ring of island fortresses broken and shattered. The test of these steels was their physical properties. To bring them into use was an act of immense courage, which had as its foundation a deep and wide technical knowledge and the knack of getting it applied.

It is improbable that the apparatus of large scale war will get any less complex. Each weapon brings its own separate metallurgical problem. Most of these can be solved within very narrow limits; the trouble comes when you face the problem of production and inspection. To-day our chief problems lie in the making and machining of the materials needed for the internal combustion turbine; metals which will retain strength, form, and dimensions at temperatures much in excess of 580° C., and will do this for prolonged periods of exposure and in face of repeated reheating and cooling. So far these materials call for large proportions of the service of rather scarce alloys, nickel, chrome, molybdenum, cobalt, and vanadium. These high alloys represent quite a new range of metals, difficult to produce and difficult to manipulate; and control of the sources of supply of their ores may well open a new phase of world politics. Among these is the determination of the United States to lay in a very large supply of ores. The demand for them for aircraft use may well be severe enough to compel the most rigid economy in the use of alloying elements for other purposes, and quite possibly the elimination of alloy-bearing constructional steels.

Steel and the Atomic Age

More remote, but still unpleasantly near, is the problem of atomic energy, and the search for a metal or an alloy with physical strength and light weight and at the same time relatively impervious to, or readily shedding, atomic infection. The enormous cost of the means of remotely controlling manufacturing processes, and of protecting working personnel, make the production of atomic weapons the prerogative of nations either with overwhelming technical resources or with a callous disregard for the lives of their scientific and technical workers.

Closely allied to the special steel industry and, indeed, almost part of it, is the heavy forge and foundry industry. The casting of steel in large masses is a serious technical problem, especially the avoiding of internal flaws or the development of inherent weaknesses. The technique which produces the main shaft of a large turbine or alternator alone made possible the production of the heavy bombs used

in the last war. Guided missiles are producing their own problems, the problem of surface homogeneity to the solution of which a notable contribution has been made in the development of fine surfaced stainless steel sheet.

The fundamental problem of steel supply in war is founded upon technical competence. Steel supplies cannot be improvised and they must have their materials. Apart from coal, our native materials are indeed exiguous. We have a mass of converting plant, reasonably efficient, which in two wars has shown remarkable resilience and adaptability, qualities which come from the sort of intelligence which is interested both in the question "How?" and in the question "Why?" A great deal of theoretical work is done, and must be done, in explaining precisely why a certain process or method achieves a given effect, because that is the only way to reproduction and improvement.

It is a matter of interest to observe the way in which Great Britain and America have dealt with their respective problems. From the time the U.S. came into the 1914–18 War to the present, American research effort has been on an enormous scale with many thousands of workers, magnificently equipped. Too much time and energy was spent on purely statistical verification of observed results. Research in Britain is, in general, much closer to production, much less spectacular, with perhaps a less firmly based theoretical side. But on the whole it is less expensive of effort and quicker in translating results into practice, a bias largely determined by an appreciation of "scale effect," the difference between what happens to a 200 lb. charge in a laboratory crucible and to a charge of 80 or 100 tons in a full size furnace.

The Supply Situation

I should, with your permission, like to draw your attention to some, at least, of the difficulties which now confront this Country in meeting the demands of war. I speak now of the steel industry as a whole. For many years the production of crude steel in Britain did not represent the tonnage of steel available for use. Great Britain possessed as an inheritance from the days of wrought-iron production, and from her central position as an importing country, a large variety of rolling mills, drawing their steel supplies in the form of semi-finished steel from France, Belgium, and Germany, where steel production was greater than the capacity of manipulating plant to use it. The interruption of supplies in the 1914–18 War showed how dangerous could be this dependence upon overseas supplies, and measures were taken for the increase of production from iron ore and coal. British steel ingot production is now at the rate of 15½ million tons per year; and when certain plants now nearing completion are at work, the potential output will be some 17½ million to 18 million tons. Broadly speaking, out of every ingot produced some 30 per cent. returns without much time lag as scrap for re-melting, leaving about 70 per cent. to be made up by new metal. That is, an ingot output of 15 million tons a year needs 10½ million tons of new metal each year. In 1950, this new metal was derived, as to about 4 million tons from home-produced iron ores containing not much more than 30 per cent. of iron, as to 4½ million tons from imported ores containing about 48/54 per cent. of iron, and as to 2½ million tons from imported metal, chiefly scrap. The imports of iron ore represented a tonnage of over eight millions. Of this, 10 per cent. came from British West Africa, 33 per cent. from French and Spanish North Africa, and 40 per cent. from Sweden.

Since 1920, the British steel industry has relied upon scrap imports rather more than is strategically justified. Scrap constitutes to-day, on the average, about

60 per cent. of the loading of a steel furnace, and 40 per cent. only is pig-iron. The debris of two successive wars, the scrapping and dismantling of much obsolete and obsolescent machinery and plant at home and abroad, have provided quite abnormal quantities of scrap. The supply is now drying up and much of the metal supplies now drawn from imported scrap will have to come from the product of smelting iron ore and using coal.

Now, iron ore for the blast furnace is a double problem. You must have for your base load a consistent and regular supply. Even for your "make up," it is to be preferred that there should be regularity and consistency. This means that an extension of metal supply from blast furnace production requires import of ore from fields or deposits capable of large scale production. British home resources are low in iron content and expensive, in terms of fuel, to smelt. We must, therefore, look about for suitable ore supplies if we are to compete on an economical basis. But to-day, iron ore of consistent good quality is regarded as a strategic asset, and rather to be preserved for future development when native power resources become available. A similar problem confronts the Eastern steel industry of the United States, with the possible exhaustion of the Mesabi range; and this explains the importance of U.S. explorations in Brazil, Venezuela, and Labrador.

The United States has the advantage of 50 years' experience of Great Lakes ore traffic and in the possession of quick loading and quick discharging equipment. Large tonnages of iron ore cannot now be carried in the multitude of small ships which carried this trade. Special carriers will be needed and they are expensive to build, to house, and to run. There is only one way in which a large scale steel industry in Great Britain can retain its economic efficiency; and that is by a restoration of the efficiency of the British coal industry. There lies the basic need, and if that can be achieved, all other problems are capable, not of easy, but at least of practicable, solution. Until then, material supplies are bound to be a real and serious concern. Until this is effected, Great Britain will stand over against the rest of Western Europe as a claimant, rather than a participant, in any pooling scheme such as that set out in the Schuman plan.

I am aware that I have only touched the fringe of this vast subject; but I should like to express my thanks to the Research Institution of Thomas Firth & John Brown, Ltd., for the loan of a film which will, I believe, make much more real than words can do some of the problems I have dealt with.

DISCUSSION

THE CHAIRMAN: Before the film is shown, it would be suitable to have any questions you may wish to put and Mr. Rawson will deal with them.

BRIGADIER O. E. CHAPMAN: I gather that nickel is one of our difficulties at the moment. Is the International Nickel Company British or American controlled?

THE LECTURER: The nickel ores are unfortunately all in Canada, and the International Nickel Company is, as its name implies, an international company in which American interests predominate.

The problem of nickel to-day is largely due to the fact that United States' home consumption has increased out of all proportion in the last five years. Nickel has come to be very much used, in the form of 18/8 stainless steel, for domestic equipment, particularly in the very large blocks of apartment houses and flats; and nickel plating has taken the place of chromium plating in the automobile industry to a large extent. It has been stated in the United States that if the thickness of the nickel plating on American motor cars were reduced by 40 per cent., ten million pounds weight of nickel a year would become available.

BRIGADIER O. E. CHAPMAN: I take it that it is under American control, then.

THE LECTURER: No, it is truly international—60 per cent. American and 40 per cent. Canadian and British.

LIEUT.-GENERAL SIR KENNETH CRAWFORD: I understand that America has gone in much more than we have for the high grade steels. What are the prospects of our being able to acquire a considerable increase in 45-ton steel?

THE LECTURER: I presume you are thinking of 45-ton carbon steels as used in America principally for war purposes. Relatively, just as much is used in this Country as in the States.

Large railway bridges have been built in America, however, especially in New York, where they are built over the highways. They have all been designed of 42- to 44-ton steel. Most of it is carbon steel with 1 to 1½ per cent. chrome and copper. It was first developed here. The first bridge built was in Denmark and it was designed of 46-ton steel. The opportunity to build structures of this kind has been greater in the States than here, and it is probably that type of steel which would have to be used for war purposes rather than the more expensive and more easily made alloyed steels.

MR. A. J. COMBS: We are faced with a development to-day which the Lecturer has not touched on. In the design of prototype weapons we are sometimes very hard pushed to obtain the necessary steel of the necessary shape. It is difficult for steel manufacturers, when they are working at fairly high speed, to provide the very small quantity you want. Sometimes it is only ninepennyworth. This holds up the production of prototypes for proving and consequently production on a large scale afterwards. How should we approach that problem to-day?

THE LECTURER: That is really a very serious problem. It is a most appalling problem for the manufacturer to produce a tiny quantity of steel. It is an instance of the sort of thing I have referred to. There are many things I should have liked to say. I think that with the development of the draw bench and extrusion press, some of these problems may disappear.

The difficulty of producing very tiny tonnages of bar of a particular shape is perhaps one of the greatest problems of steel manufacturers. It is very nearly impossible to do, in fact, in a rolling mill because you would have all your men on strike at once if you tried it. It requires great discretion. However, as I say, with the draw bench and the possibilities of extruding steels, we shall be in a much better position in the future than we have been in the past.

MR. GREENBERG: You mentioned the E.N. specifications and the shortage of nickel and chromium and molybdenum. The first series of specifications are mainly carbon, manganese, and manganese molybdenum. I should like some indication as to the prospects of getting supplies of manganese, which I understand is likely to be very difficult to obtain in the near future.

THE LECTURER: Only a very minor quantity of manganese is required in manganese and carbon steels—perhaps 100 mm. in the furnace. So far that has been available, but it is an extraordinarily difficult problem, and supplies are very chancy. The amount of carbon manganese and manganese molybdenum is so small that we hope restrictions will not be imposed.

As to the carbon steels in the E.N. range, these were put forward on the basis of the tensile and physical limits that could be got in a certain cross-section; and designers were given an opportunity of using them. They were brought into the E.N. series because they overlapped with the low alloy steels, and it was possible to convert them into low alloy steels and make the problem easier. With the position of metalloids in the World to-day, you may find you have to switch from one to another. It looks as though the demand for commercial purposes will be so great that you may have to be satisfied with what comes out of scrap. It is possible that the carbon manganese and manganese molybdenum may be a source of supply in the future.

THE CHAIRMAN: If there are no more questions, we will now have the film.

A film showing some types of steel production at Messrs. Thomas Firth-Brown's works at Sheffield was shown.

The CHAIRMAN (after the film was shown): If there are any of you who have not seen a steelworks, you have indeed a treat in store. There is no team on the Thames, at Twickenham, at Wembley, or at Lord's that can compare with the teamwork that you see throughout the whole of a steelworks. Not only that: it is so often under the direction of a quaint-looking old boy in dirty overalls who gives a nod of the head or a movement of the finger and the whole team operates and forgings take shape or cauldrons of metal pour out. In my opinion, it is one of the most thrilling sights in industry.

But these men do not do these things without management and direction and technical training, and you have heard from Mr. Rawson this afternoon what years of experience and knowledge can be packed into a lecture such as this. It is not acquired in a day. It is wonderful that it is acquired in a lifetime. As I said earlier, it is only the busy man who can find time to put down on paper all the results of his experiences and come here to talk to us about them. I think we should accord him a very deep sense of our appreciation for having come here and given us this afternoon the benefit of his knowledge and experience. (*Applause.*)

THE LECTURER: I should like, if the Chairman would permit me, to tell you that the operator at the back of the room is the man who actually took all these pictures. They were taken over a very long period of time. No professional cinema photographer could have taken them. He could never have chosen the critical moments. The film represents about three years' work. (*Applause.*)

MAJOR-GENERAL L. O. LYNE: Before we break up, may I say, on behalf of the R.U.S.I., how very pleased we are to see so many visitors here this afternoon? If any of you do not know the Institution and can spare another five minutes, the Secretary, Colonel Wilkinson, would be delighted to show you round. We have the Rubens ceiling back in the Banqueting Hall, and it is well worth a visit. Anyone who is interested might go up to the first floor and meet Colonel Wilkinson there.

It would be impertinent of me to stress the importance of the talk we have had this afternoon. I would just like to say in case the Chairman or the Lecturer should think that the audience is small in quantity—though not in quality—that this talk will go verbatim, with the Chairman's remarks and the questions, into our JOURNAL, which has a circulation of 7,000. And this by no means represents the number of people who read it, because it goes into every mess throughout the Services, and it is very largely through this JOURNAL that we are able to bring to the young officers of the Services particularly a few of the problems to-day which touch a wider realm than the purely Service one. And surely there can be no more important subject than this vital question of steel supplies in war.

Finally, Sir Graham Cunningham is, of course, not unknown to the Services. He was Director-General of Munitions Production in the Ministry of Supply for most of the War, and I for one, as a Brigade and Divisional Commander in several theatres of war, would like here to pay a very sincere tribute to his Department. I was never seriously worried about supplies of ammunition, even though we shot them off pretty freely or, as Sir Graham Cunningham described it to me over lunch, as the Divisional Artillery chasing one bicyclist after another over the horizon. I think the fact that we were not short must be due at least in some part—and some considerable part—to his tremendous energy, his vision, and his organizational abilities. We of the Services are very grateful to him.

Since the War, as well as his major preoccupations as Chairman of Triplex, Sir Graham has been Chairman of the Dollar Export Board and a member of the Economic Planning Board. He has just told us about the busy man who can always find time for more. I think he is a very good example himself. I should like, on behalf of the Institution, to tell him how much we appreciate his coming here to take the Chair this afternoon. (*Applause.*)

THE DEVELOPMENT OF PROPULSIVE MACHINERY FOR SURFACE AND SUBMARINE WARSHIPS

By CAPTAIN (E) C. P. GALLIMORE, R.N.

On Wednesday, 21st February, 1951, at 3 p.m.

VICE-ADMIRAL (E) THE HON. D. C. MAXWELL, C.B., C.B.E., in the Chair

THE CHAIRMAN: My first duty is to introduce the Lecturer, Captain C. P. Gallimore. He has had a long, interesting and varied career in the Engineering Branch of the Navy, and has served at sea including two spells of duty as Engineer Officer in large ships. He has also served twice in the Engineer-in-Chief's Department of the Admiralty and four years in dockyards. Captain Gallimore passed through the Staff Course at the Royal Naval College, Greenwich, and before taking up his present appointment, which is that of Director of Dockyards in Bath, he served for two years in the Naval Intelligence Division of the Admiralty.

I hope that after the lecture we may have a free and frank discussion with plenty of questions which the Lecturer will endeavour to answer. I must, however, remind you that the question of security crops up, and as the proceedings of the Institution are seen all over the World, the Lecturer may find that he is not able to give as full an answer as he would like. Captain Gallimore has also had to bear that in mind when preparing the lecture.

I will now ask him to address us.

LECTURE

I HAVE been invited to give a talk on the development of propulsive machinery for surface and submarine warships. The subject is a vast one and I think the best way to cover it will be to give a rapid review of early developments leading to the types of machinery fitted in our Fleet at the end of the 1914-18 War, then attempt to follow the developments through to the present day, and finally take a glimpse at what the future may hold.

To make it simpler to follow I have divided the lecture into separate sections, the first dealing with steam-driven machinery as fitted in all but the smallest surface ships, and the second dealing with internal combustion machinery as fitted in submarines, coastal craft, landing craft, and so on.

It is impossible to give a talk on this subject without quoting a number of figures, but I will try to keep these down to a minimum.

STEAM-DRIVEN MACHINERY

HISTORICAL

Steam-driven machinery was introduced into warships about 1820. Simple reciprocating steam engines, supplied with steam at very low pressures, drove paddle wheels as auxiliaries to sails.

Paddle wheels were never very popular for warships as not only were they extremely vulnerable but they deprived the ships of a considerable space needed for broadside armament.

In the early 1840's the screw propeller—a much less vulnerable form of drive—was introduced and its advantage over paddle wheels was demonstrated in a practical and very certain way in 1845, when H.M.S. "Rattler," fitted with a screw, and H.M.S. "Alecto," fitted with paddle wheels, were lashed stern to stern. The "Alecto" was allowed to develop full power ahead with the "Rattler's" engine stopped, but when

the " Rattler's " engine went ahead the " Alecto " was brought to a standstill and finally towed astern at 2½ knots in spite of all her endeavours to go in the opposite direction.

The reciprocating engines of this period were very slow running—about 20–30 revolutions per minute—and for screw propulsion it became necessary to gear up the speed of the crankshaft as much as four to one.

Although the screw propeller overcame the principal objections to the adoption of steam propulsion for warships, there was a reluctance to abandon the old line-of-battle ships. Right up to 1859 numbers of these ships were laid down purely as sailing ships, and those which were fitted with a screw had a device whereby it could be raised clear of the water when not required for steaming.

Between 1872 and 1876, however, the " Dreadnought " class of warship was introduced. These were iron hull ships, iron armoured, and had no sail power. They were twin screw ships, each screw being driven by a three cylinder engine at 67 revolutions per minute. Each engine had one high pressure and two low pressure cylinders, the latter being of 7 ft. 6 ins. diameter. Boiler pressures had risen to 60 lb. per square inch, but a radical change in boiler design was necessitated by a disastrous boiler explosion which killed 45 people in H.M.S. " Thunderer " while undergoing trials in 1876.

By the end of the XIXth century the manufacture of steel in Wales and the Midlands had brought about important developments in hull, engine and boiler construction. Boiler pressures had risen to as much as 250 lb. per square inch, although somewhat lower pressures were in general use, and engine speeds up to 112 revolutions per minute. The water tube boiler was beginning to replace the fire tube type, and triple expansion engines with high pressure, intermediate pressure, and low pressure cylinders had been introduced.

Meanwhile a very important event in the engineering world, which was destined to have far-reaching effects, had taken place. At the Jubilee Review at Spithead in 1897, Mr. (later Sir Charles) Parsons had demonstrated the Parsons steam turbine, fitted in the yacht " Turbinia." The great increase in revolutions necessary for the speeds demanded by small ships of the torpedo boat destroyer type had introduced many problems for the designers of reciprocating machinery, and H.M.S. " Viper," of 370 tons displacement, was ordered to be engined with turbines by the Parsons Marine Steam Turbine Company. This ship on trials attained a speed of 34 knots with a total of 10,000 shaft horse power and 1050 revolutions per minute.

Following the experience obtained with turbines in T.B.D's, it was decided to equip the new " Dreadnought " class of battleship with Parsons turbines in 1906. The first of this class of 18,000 ton battleships, launched in 1906, was completed in a year and a day and developed a speed of 21 knots with a total of 23,000 shaft horse power on four shafts. Built at a time when Germany was attempting to overtake us in the construction of battleships, the " Dreadnought " had a profound effect not only in setting a new standard in warship design but also of retaining the balance of naval power in our favour.

The 1914–18 War

Although by 1914 the steam turbine had been introduced in the most modern ships and the idea of burning oil fuel in ships' boilers had also begun to find favour, the outbreak of war found the Navy in the transition stage. Very large numbers of ships still had reciprocating machinery and the majority were coal burning, though some

had arrangements for burning oil as well and some destroyers were using oil fuel only. It can be said, however, that the machinery of the Fleet gave excellent service during the war years and earned well merited commendation.

Two serious troubles appeared during the War, the failure of the D-shaped water drums of boilers, caused by the internal pressure trying to make them take up a cylindrical shape and thus causing serious cutting at the wrapped joints, and the serious corrosion and erosion of brass condenser tubes. The former was overcome by the adoption of cylindrical water drums and the latter by changing the material of the tubes to cupro-nickel alloy.

Between the Wars

The period 1918–39 was one more of gradual development than spectacular advance in naval engineering. By 1920 the steam turbine and oil fired boiler had come to stay for all but the smallest surface ships, and superheated steam, which had already found many applications in land service, was receiving serious consideration.

Design Requirements

Before considering the developments between 1919 and 1939, a few words on the essential requirements of marine engines will not be out of place. The three main essentials are *reliability*, *economy* to give maximum endurance for the weight of fuel allowed, and *durability*. These must be obtained with minimum weight in the minimum space and the best economy must be obtained at all powers. The machinery must be flexible for rapid manoeuvring, and it must be simple to handle and maintain. The importance of simplicity is apt to be overlooked in peace-time when highly trained, experienced personnel are available, but becomes paramount with rapid expansion of the fleet and dilution of personnel necessitated by war conditions. Originally the requirement for rapid increases and decreases in speed was more applicable to small ships of the destroyer type, but the advent of aircraft made it an essential requirement for bigger ships, particularly aircraft carriers.

The need for durability of ships' machinery is obvious when the length of life expected from ships of all classes and the lack of money for dockyard refits in peace-time are considered. Capital ships, designed and built during the 1914–18 War, formed the backbone of the fleet in 1939.

The need for economy at all powers raises many problems for the designer. There are three main conditions where economy is important; at the peace-time cruising speed, which is the most economical speed of all but is usually too low for safety in war time, at the war cruising speed, and at full speed.

The 1914–18 War had shown the need for a reduction of vulnerability by more sub-divisions of machinery; one of our battle cruisers was almost completely immobilised by one unlucky hit.

Developments

As I said before, the inter-war period was one of gradual development. The amount of money available for such developments was very small and there were very few facilities for testing out new ideas ashore. The Admiralty had its own experimental establishments for boiler testing and fuel burner design at Haslar, and for internal combustion engines at West Drayton. For experiments with steam engine designs, however, reliance had to be placed on the engineering industry of the Country.

Superheated steam was adopted generally for post-1914–18 War designs with gradually increasing pressures and temperatures. The battleships "Nelson" and

"Rodney" had a steam pressure of 250 lb. per square inch and a temperature of 575°F.; by 1928 pressures and temperatures had risen to 300 lb. per square inch and 625°F.

In order to reduce vulnerability, what is known as the unit system of machinery layout was adopted for all ships larger than destroyers. In this system the object is to drive each propeller by its own engines supplied with steam from its own boilers, entirely independent of the other units. As far as the ships' arrangements permit, these machinery units are placed well apart.

To obtain the greatest efficiency from turbines, and thus the greatest endurance for the fuel carried, and to keep machinery weights down, it is necessary to drive the turbines at speeds very considerably greater than those desirable for propeller efficiency. For this reason some form of speed reduction gear is essential.

There are a number of possible methods of achieving this speed reduction in large installations; the two principal ones considered are mechanical gearing and electric drive. The protagonists of electric drive, which has found favour in some foreign navies, claim the following advantages :—

(*a*) Greater speed reduction is possible in a given space and therefore higher turbine speeds may be used.

(*b*) Less speed fluctuations and therefore higher turbine efficiency.

(*c*) In a mechanical gearing design a separate turbine is required for going astern; with electric drive reversible electric motors can be used and no astern turbine is required.

(*d*) Economy in wear and tear can be obtained by shutting down driving units at lower powers.

(*e*) Greater flexibility in machinery arrangement since turbines are not tied to the shafts.

(*f*) Quietness and ease of control. (These have influenced the choice in certain large liners).

(*g*) Ability to use all propellers with one turbine damaged.

On the other hand electric drive has the following disadvantages :—

(*a*) It is heavier.

(*b*) It costs more.

(*c*) It occupies more overall space.

(*d*) It introduces another link in the chain liable to breakdown.

(*e*) The overall efficiency is lower.

Weighing up all these arguments the British Admiralty decided on mechanical gearing. Single reduction gearing of the helical type has been adopted generally. The early designs of gearing introduced during and after the 1914–18 War were very noisy and much development effort has been devoted to the gear tooth forms and the methods of cutting the teeth to overcome this. Much still remains to be done on these lines to produce more efficient gears and thus reduce the weight and space they take up.

Here again, lack of testing facilities ashore has hampered progress, but as will be seen later steps have now been taken, albeit somewhat belatedly, to overcome this.

Turbine design developments between the Wars were devoted to reducing the weight and space they occupy and increasing their efficiency. Serious turbine blade failures occurred with some of the early post-1914–18 War designs due to blade

vibration. These failures occurred in turbines of the impulse type, and reaction type turbines have for this reason found greater favour in later designs.

With turbines designed for maximum efficiency at or about full power, special arrangements have to be made for efficient operation at the lower powers required for war- and peace-time cruising speeds. In some ships separate small turbines for cruising conditions were fitted, coupled either direct or through gearing to the main drive turbines. These separate turbines occupied additional weight and space and introduced undesirable steam pipe complications, and an arrangement by which cruising stages, controlled by separate valves, were fitted in the main high pressure turbines had many advantages.

Boiler developments in the inter-war years, following the change from coal to oil firing and the introduction of superheaters, were directed towards more efficient methods of burning the oil fuel by improvements in sprayer design and by arrangements for mixing the fuel with the necessary air for combustion; and to the ever-present problem of reducing the weight and space they occupy while at the same time increasing their efficiency.

Reduction in diameter of the individual water tubes in boilers allows a larger number of tubes and consequently an increased heating surface to be fitted in the same space. It is of interest to note that whereas the " Repulse " had 42 large tube boilers for 110,000 horse power, the " Hood," designed only a few years later, had 24 small tube boilers for 144,000 horse power, and a modern aircraft carrier of 150,000 horse power has eight small tube boilers.

An interesting advanced design of the inter-war years was produced for the destroyer " Acheron " in 1930. Here an attempt was made to advance the steam conditions nearer to contemporary land power station practice. The " Acheron " used superheated steam at 500 lb. per square inch and 750°F., compared with the remainder of her class with 300 lb. per square inch and 625°F. Successful trials were carried out on completion and a fuel saving of nearly 25 per cent. at full power over others of the class was obtained.

It was indeed unfortunate that, shortly after completion and while the teething troubles which are to be expected with any new design were being experienced, the ship was transferred with the rest of the flotilla to the Mediterranean to carry out normal peace-time duties on that station. Now, although normal duties may be a good way of finding out weaknesses in a design, it would be far better where radical changes have been made to exempt the ship from all other duties and run it hard for a prolonged period under the control of the designers and with the best maintenance facilities immediately available. The high pressure turbines of the " Acheron " gave continuous trouble which could undoubtedly have been overcome by development. Unfortunately, however, the Country was passing through a financial crisis and no money was available for the changes necessary to complete the trial.

A contrast to this was a similar experiment in advanced steam conditions carried out by the United States Navy shortly afterwards. With greater resources available they introduced steam at a slightly lower pressure but a higher degree of superheat than the " Acheron " in a whole flotilla of destroyers, and ran them as experimental ships until the teething troubles had been overcome.

Nevertheless, advances were made in marine engineering design by steady progress during these difficult inter-war years, when experimental work was strictly limited by financial stringency. This progress is perhaps most simply illustrated by

a comparison of the machinery fitted in the " Queen Elizabeth " class battleships as originally built in 1915, and after modernisation before the 1939-45 War.

TABLE I.

QUEEN ELIZABETH CLASS

80,000 s.h.p. MACHINERY

	As originally designed 1914	After modernisation 1938
Weight of main engines and boilers.	3080 tons	1570 tons
Output (s.h.p.) per ton of engines and boilers	26 s.h.p.	51 s.h.p.
Floor space occupied by machinery	13,150 square feet	8610 square feet
Steam consumption at full power	12.8 lb./s.h.p./hr.	9.4 lb./s.h.p./hr.

The original direct drive turbine and 24 saturated steam boilers working at a pressure of 235 lb. per square inch were replaced by geared turbines and eight superheated steam boilers working at 400 lb. per square inch and 700°F. The saving in weight of the machinery installation was 50 per cent. and, in space occupied, 33⅓ per cent. The endurance was considerably increased and, in fact, at the most economical speed it was trebled.

Although these advances were quite good as far as they went, it was obvious that, with further research, particularly into the metallurgical problems associated with increasing steam temperatures, and into improvement in manufacturing methods, much more could be achieved. By 1936, however, war clouds were blowing up over Europe and a policy had to be adopted for a big construction programme. In view of our experience in the " Acheron," it was decided to take no risks with big advances of an experimental nature. As a result, at the outbreak of war in 1939, our large ships—cruisers and above—were using steam at 400 lb. per square inch and 700°F., and destroyers at 300 lb. per square inch and 650°F. The adoption of the lower conditions in destroyers was necessitated by requirements for ease of maintenance and also by the need to extend the production field for the large numbers required.

THE 1939–45 WAR

The machinery fitted in our ships for the 1939–45 War stood the tests of war conditions as regards reliability and ease of maintenance. Ships were called on to steam prodigious distances, often with inadequate maintenance and refitting facilities. Replenishment of fuel and stores was carried out at sea, particularly after the War spread to the Pacific, so that machinery had to run for weeks on end without stopping.

New developments in weapons of war brought unforeseen difficulties. The magnetic mine with its non-contact explosions caused a great deal of trouble due to the effects of shock on the more brittle parts of machinery made of cast iron. The first really serious mining was the cruiser " Belfast " in 1940, and urgent steps had to be taken by means of changes of material, elimination of overhanging parts, resilient mounting of machinery, and so on, to minimise the effects in other ships.

Air bombing raised fire risks much more serious than had ever been known with shellfire.

Wartime oil fuel supplies were often not up to the standards we had been used to. Fuel was frequently contaminated by sea water either in the tankers bringing it or in the warships' tanks after damage. This sea water contamination introduced a serious trouble in boilers in the nature of very hard deposits on the fire side of the tubes, causing blocking of the gas passages and serious loss of efficiency. Thorough boiler cleaning was the only remedy, but operational requirements did not always allow the necessary time in harbour for this to be done.

Our policy of dividing the propulsive machinery into completely independent units, referred to earlier, was entirely vindicated, and many heavily damaged ships were able to steam back to their repair yards.

Wartime Requirements—Steam Machinery

The German submarine war quickly showed the need for very large numbers of convoy escort vessels. In order to get these in anything like the numbers required, large sections of industry never before used for warship construction, employing mass production methods, had to be used. A simple type of reciprocating machinery, in the manufacture of which large numbers of firms had experience, was reintroduced and gave excellent service in the lower speed escort vessels.

To counter operations by German E-Boats in the Channel, a new type of small fast gunboat was called for. Petrol engines of the necessary power for the speed for these 115-feet long hulls were not available and in any case requirements for silence and minimum fire risk made steam machinery desirable if it could be produced.

By accepting a high full power propeller speed of 900 revs. per min., and also accepting the fact that a long life was not expected and therefore allowances for wastage of material by corrosion could be much reduced, a satisfactory design consisting of one boiler supplying steam at 400 lb. per square inch and 700°F. to two sets of turbines, giving a total of 8,000 s.h.p., was produced. By cutting weight in every direction, including even the spanners supplied for maintenance and the engine room ladders, the weight of the steam gun boat machinery was brought down to 14 lb. per shaft horse power, compared with 31 lb./s.h.p. in contemporary destroyer designs and something over 50 lb./s.h.p. in the " Queen Elizabeth " design shown earlier.

Comparison with other Navies and with Shore Practice

Our association with the United States Navy during the War showed that, although our ships were every bit as satisfactory as regards reliability and durability of machinery, the U.S. designs, having been frozen some years later and having taken full advantage of contemporary land power station practice in that country, were considerably ahead of ours in endurance, and in weight and space occupied by machinery. Higher steam pressures and temperatures had been adopted as a result of prolonged experiments ; and improved manufacturing methods, particularly in the gear cutting field, had led to the fitting of double reduction gearing which permitted higher turbine speeds.

German naval designers had also adopted higher steam pressures and temperatures, but the lack of thorough testing, combined with over enthusiasm, led them into some remarkable errors, with the result that reliability and durability were sacrificed. In fact, the German steam designs, as opposed to their submarine internal combustion engine designs, have been described as masterpieces of misapplication. Certainly the " Narvik " class destroyer handed over to us for trials in 1945, in spite

of using superheated steam at 1,100 lb. per square inch and 930°F., had very congested machinery spaces, occupying a greater length than those of corresponding British destroyers. The steam consumption was also higher.

Post-War Developments

Before the end of the 1939–45 War, it was obvious that urgent steps would have to be taken to reduce the weight and space occupied by machinery and increase its efficiency still further. A destroyer design was prepared—the " Daring " class—to use steam at 650 lb. per square inch and 850°F. For this design, and for further work in the high pressure-high temperature field, great advances are required in the detail design and manufacture of turbines, high precision gearing, steam valve and steam pipes, condensers, and auxiliary machinery. This work can only be undertaken with full co-operation of the engineering industry of the Country, and more research and testing facilities ashore will have to be provided.

The firms in industry have already shown that they appreciate their lack of these facilities and have taken an important step to put this right by setting up the Parsons & Maine Engineering Turbine Research and Development Association (PAMETRADA). The Association's establishment on Tyneside includes a test home in which high-powered marine boilers, turbines, and gearing can be tested at full powers. Some of the " Daring " class machinery has already been tested there. This Association works in close co-operation with a gearing research association—the Admiralty Vickers Gearing Research Association (AVGRA)—in investigating and testing gear cutting machines and methods.

The introduction by the Germans during the War of submarines with considerably higher underwater speeds than any known before has brought with it many problems for the design of machinery for anti-submarine warships. The machinery for the submarines themselves is dealt with later, but under this heading of steam machinery I should like to say a few words about the requirement for fast anti-submarine vessels.

The problem of fitting machinery occupying the absolute minimum of space and weight has become much more acute since the introduction of radar and other methods of detection and attack direction. The radar itself requires considerable space and weight for its accommodation, and its maintenance calls for the housing of increasing numbers of skilled personnel. Weapons and their control systems for combating submarines and for defence against air attack tend to become heavier, and greater speeds of ships, requiring more powerful machinery, are called for.

The smaller the ship the bigger is the proportion of total displacement needed for machinery and fuel for a given speed and endurance. For instance, in the latest destroyer design the machinery spaces occupy one-third of the length of the ship, and the weight of machinery plus fuel accounts for 40 per cent. of the displacement. Every effort must, therefore, be made to put more and more power into less and less space and weight, since future navies are likely to include a larger proportion of small ships.

For the latest design of anti-submarine frigate, machinery using steam conditions as in 1939 ships was completely out of court on the score of weight and space, and the Admiralty, with the co-operation of the engineering industry of the Country, has considered designs employing advanced steam conditions. A decision has been reached to use pressures and temperatures higher than any used in the fleet

so far. Designs of every item that goes to make up the complete machinery installation have been examined in detail with a view to weight saving by the use of improved materials and manufacturing technique.

As a result of this critical examination it has been found possible to reduce the length of the machinery compartments by 22 feet, and the weight of the machinery plus fuel for the specified endurance by 300 tons over a design using 1939 figures.

Although this represents a considerable advance, it cannot be allowed to rest there, since the ship constructor makes continuous and insistent demands on the engineer for reductions in weight and space of machinery. Moreover, it must be borne in mind that the period from the time of first consideration of a design to the appearance of a ship in service is about five years.

We shall, certainly with the smaller ships, be forced to modify our policy of maintenance and repairs of machinery on board, and to adopt more and more the practice of having complete spare units available for fitting at a dockyard or repair base.

INTERNAL COMBUSTION ENGINES

I have dealt at some length with steam-driven machinery because it has been, and still is, used for propulsion of most major surface warships. The internal combustion engine, however, has a number of important uses for small craft employed for coastal forces and combined operations.

Coastal motor boats, used in the 1914–18 War, were driven by petrol engines of British and American manufacture and gave good service under difficult conditions. Very little work was done on craft of this type between the Wars, due to lack of money, until about 1937, when prototype motor torpedo boats were built by several firms, the engines used being the Napier " Sea Lion " of 550 h.p., Isotta of 1,150 h.p., and the Rolls Royce Merlin of 1,100 h.p. All these were petrol engines because there was no suitable British compression ignition (or Diesel) engine available.

Diesel engines have obvious advantages for light vulnerable craft, such as motor torpedo boats, on account of the reduced fire risk with Diesel fuel and a greater endurance for the same weight of fuel. Attempts were made to develop a suitable British high speed Diesel for small craft, but the time for development was too short and we were forced to fit petrol engines. The most suitable petrol engine which could be obtained in the quantities required was the American Packard engine of 1250 h.p. These gave excellent service, but in order to avoid having to rely on supplies from overseas again, suitable Diesel engines are now being developed in this Country.

SUBMARINES

The most important use of internal combustion engines in warships is in submarines. In spite of rival claims put forward recently in the U.S.S.R., it is almost certain that the first propelled submarine was built in the U.S.A. in 1775 by David Bushnell, a student at Yale. He discovered that a charge of gunpowder could be exploded underwater, and constructed a one man underwater craft driven by hand-worked horizontal and vertical propellers in which an attempt was made to fasten an underwater charge on the flagship of the British Fleet in New York harbour.

We have travelled a long way since then in submarine propulsion. Petrol engines for driving on the surface and for charging batteries to supply current for electric motors when submerged were tried, but gave place to Diesel engines by the 1914–18 War for obvious reasons.

The machinery universally adopted for submarines consisted of a twin shaft arrangement with, on each shaft, a Diesel engine, an engine clutch, a dynamo for charging batteries which could also be used as a motor when submerged, a tail clutch, and a propeller. Thus, on the surface with all clutches in, the Diesel engines drive the propellers; with the engine clutches in and the tail clutches out, the Diesels drive the dynamos for charging batteries. When submerged, the engine clutches are out and the tail clutches in and the motors, supplied with current from the batteries, drive the propellers. Due to the very large weights of electric batteries, the power available for submerged drive is comparatively small and submerged speeds are low.

The Germans, who in both World Wars were the main users of submarines, found that by 1939 the methods of submarine detection and hunting had so improved that higher submerged speeds were essential for submarine operations. They first devised a means whereby the Diesel engines used for surface drive could get their necessary air supply and discharge their exhaust through long vertical tubes, known as Schnorkel. Thus a large part (about 75 per cent.) of the Diesel power was available for driving the submarine underwater with only the tops of the tubes showing. The Schnorkel tubes were hinged so that they could be lowered onto the hull when not in use.

During the War the Germans also streamlined the hulls of their latest submarines and cut out most of the bridge structure, guns, and other protuberances in order to increase underwater speed. Then they added very much larger batteries and high-powered motors, the result being the Type XXI submarine capable of a speed completely submerged of 17 knots for about half an hour, after which it had to return to Schnorkelling depth to recharge the batteries.

These were considered as interim measures only towards the achievement of the true submarine. The German designer, Dr. Walter, decided that machinery which did not require oxygen from the atmosphere for combustion of its fuel was required. He decided to try hydrogen peroxide in a concentration of 80 per cent. as an oxygen carrier. This concentrated hydrogen peroxide is an unstable substance which looks like water. It is very expensive to produce. In the presence of a catalyst it decomposes to form oxygen and superheated steam, giving off a great deal of heat in the process. Fuel may be burnt in the oxygen to produce more heat. The superheated steam and products of combustion are then used to drive turbines.

Submarines using this type of drive were built by the Germans and it is, indeed, fortunate for us that the War ended before they came into operational service as they would have been capable of underwater speeds of well over 20 knots for up to six hours, rendering their detection and destruction extremely difficult, if not impossible, with the escorting forces then available. Since the War all countries have been very interested in this form of drive employing an oxygen carrier for submerged operation, and much development work using various substances is going on.

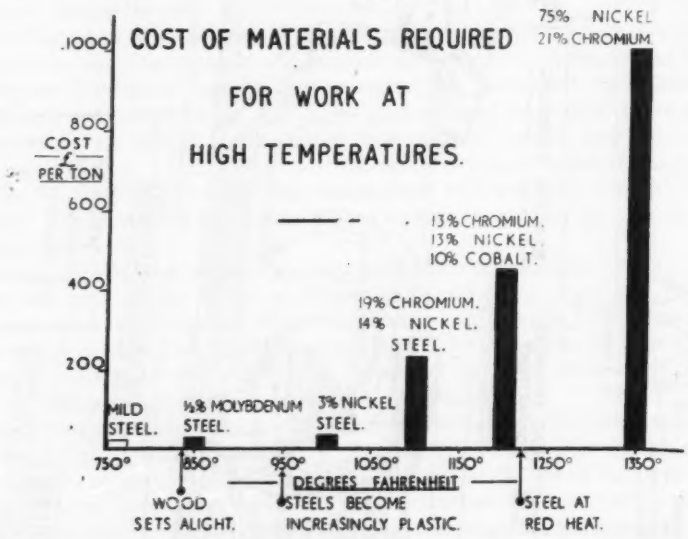
Recently reports have appeared in the Press about the application of atomic energy to submarine propulsion. The answer may be some years away, but there is no doubt that in this field, more so than in any other application to marine propulsion, the idea is very attractive. Figure I shows an artist's impression which appeared in the British Press of what the machinery for an atomic-driven submarine might look like. The nuclear reactor (or atomic pile) would give up large quantities of heat to some form of gas surrounding it. This gas in turn would give up heat to a form of boiler which would supply superheated steam to turbines for driving the propellers.

FIG. 1. ATOMIC MACHINERY LAYOUT

Gas Turbines

I cannot leave the subject of internal combustion engines without a short reference to gas turbines. The theoretical advantage of using gas turbines has been known for many years. They depend, however, on the ability to use much higher temperatures than in normal steam practice, and therefore special heat-resisting materials are essential. Table II is an illustration of what happens to well known metals at various temperatures and how the production costs increase for the production of heat-resisting alloys.

Table II.



Gas turbines are particularly suitable for aircraft propulsion where long machinery life is not an overriding requirement. Thanks to recent developments in this field it has been possible to start development of marine gas turbines.

It was realized that the necessary development work for a marine gas turbine unit would present many difficulties and would take some years. In order, therefore, to gain experience of the running of a gas turbine under marine conditions, it was decided to take an existing motor gun boat and replace one of the petrol engines by a gas turbine based on existing aircraft designs. By this means the gas turbine could be used for maximum efficiency at full power only, since problems of manoeuvring and reversing could be left to the other two shafts which were driven by the original petrol engines.

The experiment was carried out in M.G.B. 2009 and, as has been reported in the technical press, successful trials were carried out in 1947. This boat has continued running and is providing valuable experience in the practical running of a gas turbine at sea.

In the meantime the development of other gas turbines for marine use is proceeding, and full consideration is being given to the usual naval requirements of reliability, economy at all powers, and durability. Astern drive in some form will be a requirement and one possibility is the use of variable pitch reversible propellers.

For economical running of a gas turbine, an efficient means of recovering as much as possible of the heat from the very hot exhaust gases and passing it back to the inlet side of the turbine is an essential requirement. Much thought is being given to the problem of these heat exchangers, since once again the weight and space problems rear their ugly heads and heat exchangers developed for land uses are much too big and heavy.

Perhaps, however, the greatest problem for the designer of the marine gas turbine is the type of fuel likely to be available. The gas turbine, to be in any way a serious competitor with Diesel and steam engines at sea, must be capable of using the heavy residual oils which are used in boiler furnaces.

Table III shows the percentages of the various fuels and oils obtained by distillation of a ton of crude petroleum as obtained from the oil wells. On the left are the percentages obtained by the earlier methods of straight distillation and on the right the yields using the most modern methods of cracking, and so on. These new methods were, of course, introduced to cope with the demand for petrol for aircraft and land transport; and also as a result of the replacement of some mercantile marine tonnage, previously steam driven, by motor ships.

TABLE III

SPLIT-UP OF CRUDE PETROLEUM

OLD APPROXIMATE AVERAGE SPLIT BY STRAIGHT DISTILLATION.	%	NEW AVERAGE YIELD 1948.—ALL U.S.A. REFINERIES USING MODERN METHODS	%
PETROL	32.	PETROL	45½
KEROSINE	10	KEROSINE	6
DIESEL FUELS	15	DIESEL FUELS	18½
LUBRICATING OILS	5	LUBRICATING OILS	2½
BOILER FUELS	30	BOILER FUELS	23
WAX ASPHALT-LOSS	8	WAX ASPHALT-LOSS	4½

NOTE. LARGE INCREASE IN PETROL.
SMALL INCREASE IN DIESEL FUEL. [DIESEL + KEROSINE
LARGE DECREASE IN BOILER FUEL. UNCHANGED.]

The boiler, or residual, fuels contain much solid material and impurities. The turbine blade clearances of gas turbines are necessarily very small for efficient running and deposits of the solid content of boiler fuels tend to absorb these fine clearances very quickly. Nevertheless, it is certain that if the stocks of crude petroleum in the World's oilfields are not to be exhausted before alternative heat producers are developed, the heavy fractions must be used and, as I said, the gas turbine for ship propulsion will have to be one of the users.

CONCLUSION

I have tried in this brief review to trace the important steps in the development of propulsive machinery from the time of its introduction into warships. Progress has been slow but steady. More spectacular progress might well have been made if more facilities for the thorough testing of complete units ashore had been available. There is no doubt, too, that the emphasis on weight saving imposed by the Washington Treaty of 1921 was a deterrent to progress, since it resulted in even greater emphasis being placed on weight saving than on efficiency.

First steps have now been taken towards the provision of testing facilities and it is to be hoped that this will be a continuous policy. It is to be hoped, too, that ships in which major advances in machinery design have been attempted will be given adequate time for the teething troubles, inevitable with any new design, to be overcome before the ship has to take over full fleet duties.

We are at a most interesting stage in engineering development. The steam engine will, I believe, continue to be our main propulsive unit for many years. It is likely to move into fields of still higher temperatures, and perhaps pressures, but we must be certain that these are suitable for marine requirements, which are more arduous than those for shore plant.

The Diesel engine is very much alive and for small ships, where units of 2000–3000 horse power are suitable, will be required, suitably developed, for some time to come.

The gas turbine is on the threshold and probably has a big future in the marine world once the difficulties referred to concerning durability, efficiency at all powers, and the ability to use residual fuels have been overcome.

Atomic energy is not so far away and is probably more likely to be of use for marine and power station applications than to the aircraft or land transport industries. We must be ready to develop it as soon as it passes the fundamental and scientific research stage.

DISCUSSION

LIEUTENANT-COMMANDER F. P. U. CROKER: The Germans used Diesel machinery in their pocket battleships in order to provide greater endurance. Might there be a use for Diesel machinery with our cruisers for the same purpose?

THE LECTURER: If we can develop a suitable high-speed Diesel unit which occupies the right amount of space and is within the necessary weight restriction, I think that undoubtedly there is a requirement; but those pocket battleships were, for the size of ship, considerably lower in speed than anything we should envisage for ships of that size. The speed was lower than that of our cruisers, and in order to obtain that extra speed it would be necessary to increase the amount of power required from Diesel units.

LIEUTENANT-COLONEL L. V. S. BLACKER: What prospect is there of the use of gas turbines with pulverised coal or colloidal fuels?

THE LECTURER: I think that work is being carried out along those lines now. Whether they will pulverise coal for marine use is another matter, because it would necessitate carrying pulverising plant on board to produce the fuel. I do not think that pulverised coal can be carried in bunkers with safety in the same way as oil.

LIEUTENANT-COLONEL BLACKER: With regard to twin-screw ships, the propeller shafting is inclined inwards and is not usually parallel. I should like to know what effect that angle of inclination has on the steering and whether there is a tendency to set the steering in the horizontal plane or otherwise.

THE LECTURER: I do not think one can say that it is usual for the shafts to be inclined in any particular direction. I think that it depends on the shape of the stern of the ship. A very broad stern ship might require shafts sloping outwards. I should say that it would have very little effect on the steering.

LIEUTENANT-COLONEL BLACKER: When the shafts are inclined inwards is the ship steadier to steer than if they are parallel?

THE LECTURER: I am afraid I do not know that.

MR. O. THORNEYCROFT: In one of the charts the lecturer shows the rise in cost of materials at increasing temperature. Could it be taken that those temperatures appropriate to those materials presuppose equal life or approximately so?

THE LECTURER: I should say yes, but it is a very difficult question to answer because these types of materials have not been tested in use for anything like the time the other materials have been tested.

THE CHAIRMAN

I think that you will all agree we have listened to a very informative, comprehensive and, I hope you will also agree, interesting lecture. The matters which have been brought up in the discussion also contributed to that interest. I should like, if I may, to make one or two points myself, but I hope I shall not be accused of attempting to give another lecture.

The three major steps in the development of machinery in the last 50 years—I am talking of steam machinery—have been the change from reciprocating to turbine engines, the change from coal to oil, and the adoption of gearing. I shall quote later some resulting figures on horse power per man of engine room complement, because I think that they are of considerable interest. They are in some cases difficult to sort out because other variables come in to cloud the issue.

The change from reciprocating to turbine engines is a clear issue. The change from coal to oil has two effects; first is the direct effect of doing away with bunkers and of the handling of coal, and the second is that by using oil instead of coal it is possible to develop boilers to much higher individual outputs and thus cut down the number of boilers. The adoption of gearing has not a very great effect on the question of manpower; its purpose is to obtain a gain in efficiency due to running the turbines and propellers respectively at the proper speeds.

The other advances which have been and are being made, of which the most important is the increase in steam pressures and temperatures, are gradual improvements to obtain increased economy and do not greatly affect the engine room complement. In making these advances great care has to be exercised to ensure that the very important factor of reliability is not in any way sacrificed.

The following are some figures which I give as an indication of the large saving in manpower which has resulted from these developments. Taking first the "Iron Duke" of the 1914-18 War, she was a coal-fired turbine ship and the horse power per man of engine room complement was 129. The machinery almost exactly corresponded to that of the "Revenge" which was changed over to oil fuel during construction, as a result of which the horse power per man of engine room complement went up to 189. To jump from there to a modern battleship, the "King George V" class, the figure has gone up to 382. I admit that the comparison is not quite true because the horse-power has gone up too; this in itself helps to keep down comparative complement, because larger turbines do not entail any great increase in manpower, provided the number of units is the same. However, there was also a greater subdivision of the ship for safety purposes and this adds to the manpower requirement.

Another interesting comparison concerns the "Queen Elizabeth" before and after modernizing. The ship was oil fired with turbine machinery in both cases, but for the

latter case turbine gearing was fitted. The horse power per man of engine room complement went up from 282 before modernizing to 325 afterwards.

Battle cruisers provide an interesting example. The " Tiger " of the 1914-18 War was coal-fired with turbine machinery and the horse-power per man of engine room complement was 136. In the " Hood " which was fitted with oil-fired boilers and geared turbine machinery, the figure for horse power per man of engine room complement was 470.

In destroyers of a class completed in 1908 which were coal-fired turbine ships, admittedly with rather low horse power, the horse power per man of engine room complement was 206. In a later class with a change to oil firing and with some increase in power, the figure went up to 885, and the latest type of destroyer has a figure of just over 1000.

Perhaps I might now pass to what I consider to be the main lessons to be learned from the story which we have heard. The first is that the development of machinery cannot proceed by fits and starts. We were very much hampered by that between the Wars due to the varying circumstances of finance in the Country, and possibly by some lack of appreciation of the real need for ordered progress in development. Since the last war I am glad to say that we have been much more fortunate in this respect and development is proceeding to an ordered plan. It is aimed at the particular requirements of the Board of Admiralty, and the money provided forms a large proportion of the Admiralty expenditure on research and development. That, I feel, is a most satisfactory state of affairs from which we hope to secure great achievements.

The second lesson is that development, as was pointed out by the lecturer, cannot properly be advanced without means of testing a new project before it is adopted for service. That may mean testing ashore or it may mean some special prototype ship for testing afloat, or a combination of both. This particular aspect is the more important as one advances in design, because one is approaching more nearly the limits of materials, and therefore it is essential to prove reliability before the machinery is put into service.

It is of interest in this connection to note that the biggest advances which have been made in steam ships have been on the burning of oil fuel, and the improvements in boiler design. We were fortunate that the Oil Fuel and Boiler Testing Station at Haslar was established in 1901, thanks, I think I am right in saying, to Lord Fisher. That establishment has been of the greatest value in helping us towards those big advances, both of which, as has been seen, gave us large gains in manpower.

The development of turbines and gearing has been by slow, cautious advances, because each time we had to wait for experience on service before making the next step. We now have the establishments mentioned by the lecturer to help us with fundamental gearing research and development and the testing of prototype turbines before they are put into ships. We can hope, therefore, for more rapid progress in the future.

With regard to the internal combustion engine, I feel that we have made steady progress over the years, due largely to the fact that we set up some years ago the Admiralty Engineering Laboratory at West Drayton. I believe that Lord Fisher was also largely responsible for setting up that laboratory. We shall bear these things in mind when we get to later types of development, such as the use of atomic energy, which has been suggested as a possibility, particularly for submarines.

It now gives me very great pleasure to propose a hearty vote of thanks to the lecturer for a very interesting lecture this afternoon. (*Applause.*)

THE CAMPAIGN AGAINST THE TERRORISTS IN MALAYA

By Air Vice-Marshal Sir Francis Mellersh, K.B.E., A.F.C.

On Wednesday, 7th March, 1951, at 3 p.m.

Air Marshal Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C., in the Chair

The Chairman: It is my privilege this afternoon to introduce to you Air Vice-Marshal Sir Francis Mellersh. During the last eighteen months he has held the dignified, if troublesome, appointment of A.O.C. Malaya. He has been in Malaya since the outbreak of the rebellion in June, 1948, and has been A.O.C. since May, 1949, until returning to this Country in February of this year.

Recently, as you probably know, he has had conferred upon him the Knighthood of the Most Excellent Order of the British Empire for his distinguished services in Malaya.

I will now ask the Air Vice-Marshal kindly to give us his lecture.

LECTURE

To appreciate the causes underlying the campaign against terrorism which has been waging in Malaya since June, 1948, it is necessary to go back to the latter part of 1941. The possibility of Malaya falling to the Japanese could then no longer be ignored, and it was considered desirable to build up an organization of trained agents who would continue to work underground, and to conduct guerilla operations, should the Country be over-run.

Negotiations were opened with leading members of the Malayan Communist Party which resulted in the setting up of a training establishment in Singapore, under picked British Army officers, to prepare a number of young Chinese for this special task. It is ironical that, in the light of subsequent events, the Communists then boasted the only organization on which such a plan could be based.

This training establishment had been running for some five months only when Singapore fell. The Chinese agents, together with some of their instructors, disappeared into the jungle and set about the organization of what came to be called the Malayan People's Anti-Japanese Army.

Other members of the staff made good their escape to Ceylon and many of them were absorbed into what was later known as Force 136. This was developed into a highly specialized formation manned, in the main, by ex-residents of Malaya, chosen for their long experience of the Country and their familiarity with its languages. The purpose of the organization was to co-ordinate the guerilla activities of the Malayan People's Anti-Japanese Army, to provide its members with the arms and ammunition they needed, and to obtain in return intelligence concerning the Japanese on which to base plans for the eventual recapture of the peninsula.

Contact had been re-established with Malaya in early 1943, and in the months which followed members of Force 136, together with arms and equipment, were dropped by parachute from night-flying Liberators, or were put ashore by submarine, to maintain close collaboration with the M.P.A.J.A. and to strengthen the internal resistance being offered to the enemy. At this time the Malayan Communist Party, for its own purpose, was pleased to co-operate with us, while we, for lack of a better tool, were compelled to work with an organization which, until Hitler turned on his former Russian allies, had been avowedly and actively anti-British.

By the time the Japanese in Malaya capitulated there had been built up a highly organized and well-armed Resistance Army under British control. It was decided to keep this in being for another six months or so as a means of retaining some measure of control over the disorderly elements scattered about the Country and also, incidentally, over the Communists who formed the bulk of the M.P.A.J.A.

The Malayan People's Anti-Japanese Army was officially disbanded in December, 1945, and its members were instructed to come in and to surrender their arms. Although about 6,000 of them did so, there remained unaccounted for in the jungle large quantities of weapons and ammunition supplied originally by the British or obtained from other sources. In this way considerable numbers continued to carry arms, as did many of their supporters who had not come forward to be demobilized.

Thus was born a clandestine military force under the control of the Malayan Communist Party, with which was to become associated a large number of robbers and murderers who, although not by any means all convinced Communists, had found in the ensuing disturbances unlimited opportunities for pursuing their own anti-social inclinations.

Communist Intentions

Although it suited the Communist book to co-operate with the British in engineering the downfall of the Japanese in Malaya, the Party never for a moment lost sight of its long-term plans for disrupting the Country and for turning Malaya into a regular Communist State on the now well-known pattern. The Japanese having been duly expelled, the British in their turn were also to be expelled in the fullness of time.

The early arrival of British Forces and the establishment of a British Military Administration made it impossible for the Communists to achieve their aims by anything in the nature of a *coup d'état*. While making a show, therefore, of continuing co-operation with ourselves, they sought to advance their programme by underground means, such as infiltrating into public organizations, increasing their influence over the Trades Unions, and corrupting schools and youth organizations.

By March, 1948, it had become apparent to the Communists that they could not succeed in carrying out their plan by peaceful means and they therefore sought to embarrass the Government by a more violent programme of labour unrest and open terrorism. When this also failed to achieve the desired result, the campaign began to take a more vicious turn. In June, 1948, the militant elements of the Party took to the jungle and set in motion a planned series of murders of estate managers and other labour employers, together with attacks on isolated Police posts. This may be said to have marked the beginning of the present emergency.

THE ENEMY

We must now consider our enemy and the backing behind him. At the beginning of the emergency the total available strength was estimated at between 4,000 and 5,000, of whom approximately 2,500 were termed " hard core "—that is to say, known Communists already under arms. The " hard core " was rapidly supplemented by an appreciable number of Communist sympathizers, Left Wing Trade Union officials, and ex-members of the M.P.A.J.A., all of whom went underground when the state of emergency was proclaimed.

In December, 1948, the enemy appreciated that his plan to take over the Country was far behind schedule and he therefore decided to re-organize and modify his plan of action. The Central Executive Committee of the Malayan Communist Party

circulated among its members a document which became known as the " December Plan." This " Plan " aimed at setting up three main force areas, each with its own Headquarters.

First, in the North, with Headquarters on the Kedah/Siam border.

Secondly, in Central Malaya, with Headquarters in the Pahang/Kelantan border area, and

Thirdly, in the South, with Headquarters in South Selangor/Negri Sembilan.

Each Headquarters controlled a number of Regiments, spread out over the area under its command.

In February, 1949, a " Manifesto " issued by the same source proclaimed the re-organization to have been completed and listed nine Regiments deployed throughout Malaya. Later, a tenth Regiment was formed from three Malayan gangs in Central Pahang.

This re-organization of the Malayan Races Liberation Army, as the terrorists were then pleased to call themselves, has enabled them to co-ordinate their efforts, and undoubtedly their ability to wage guerilla warfare has improved in spite of the casualties they have incurred and the stronger Security Forces which are now ranged against them. In spite of considerable casualties during the course of the emergency, there appears to be little overall reduction in their strength and recruiting has continued, sometimes no doubt willingly, sometimes by threat.

The M.R.L.A. are armed with those weapons and ammunition which were originally taken into the jungle by members of the M.P.A.J.A., or were dropped by air for Force 136, or were left behind by the Japanese. Large quantities were buried in the jungle and it is on these stocks that the terrorists are still relying. There is no evidence that they have succeeded in bringing additional supplies into the Country, but it seems that, in spite of the capture of large quantities by the Security Forces, they still have sufficient to enable them to continue the fight for a considerable time.

The " Min Yuen "

The M.R.L.A. are backed by an organization known as the " Min Yuen," or " People's Movement." This is composed of disaffected elements of the population who, while not openly declaring themselves, afford the insurgents moral support, protection, and active help in varying degrees. It is impossible to give an assessment of their numbers, but there can be little doubt that they total at least as many as those whom they support in the jungle. Recently it is becoming apparent that many of the members of the " Min Yuen " now bear arms themselves and are playing a more active part in terrorist operations. It is, in fact, becoming increasingly difficult to distinguish between the " Min Yuen " and the insurgents proper. The role of the " Min Yuen " includes the supply of food, funds, clothing, medical supplies, and (not least important) intelligence concerning the movements of our own Ground Forces. In addition they are responsible for the dissemination of propaganda.

Squatters

In their turn the " Min Yuen " depend upon the innumerable Chinese squatters who are scattered throughout Malaya. Most of these had either fled to undeveloped areas to escape from the Japanese, or had immigrated illegally from China. They are to be found in the vicinity of the rubber estates and tin mines which border on the jungle, as well as in remote and frequently inaccessible spots throughout the Country.

It has been estimated that, when the emergency started, there were nearly half a million of them. In the main they are located beyond the scope of police control and protection and thus fall easy victims to the terrorists. The bringing of these squatters under control is one of the main problems of the Administration.

Communist Plan of Campaign

Once the Communists became committed to a course of armed resistance to the Government, they adopted as their strategic plan, first, the creation of economic chaos throughout the country by a programme of assassination and terrorism designed to undermine the confidence of the British Administration ; secondly, to " liberate " certain isolated country areas ; and thirdly, to link up the " liberated " areas, capture towns, and initiate a country-wide state of revolution. They originally estimated that six months would suffice to complete each of these three successive stages (i.e., that eighteen months to two years would see Malaya transformed into a completely Communist State). As it is, the measures taken by the Government and Security Forces have so far, after a lapse of over two-and-a-half years, prevented them from progressing beyond the first phase.

I want now to make it clear that this campaign is not, in the strict sense of the term, a military operation. It is a problem for the Civil Administration and it is, first and foremost, a Police affair. Martial Law has not been declared. The Government have ample powers for dealing with the situation and the declaration of Martial Law would only introduce complications which are unnecessary and which would further tax present Army resources.

Malaya—Communications—Climate

I should now, I think, say a word about the Country. Malaya is roughly the size of England and Wales, and two-thirds of it is covered with some of the densest jungle to be found anywhere in the world. Running down the centre, in the form of a spine, is a range of jungle-covered hills rising to a height of nearly 8,000 feet.

On the Western side of the range of hills, roads and rail facilities are reasonably good. On the Eastern side, however, communications, particularly lateral road communications, are very poor and for great parts almost non-existent. Even the railway, which formerly ran through the centre up to Kota Bharu in the North-East corner, has been cut from Mentakab to Kuala Krai, a distance of about 150 miles, since the rails, which were removed by the Japanese to form part of the Burma-Siam railway built by our prisoners-of-war, have not yet been replaced. The Eastern part of the Country is thus particularly in need of opening up. Vast areas are, in fact, almost impenetrable.

All airfields in Malaya suitable for aircraft other than the Auster, or something similar, are situated on, or close to, the coast. On the Western side there is an adequate chain of reasonably good airfields from Alor Star in the North down through Penang, Taiping, Malacca, and Kluang to Singapore Island. On the Eastern coast, however, the position is less satisfactory since there is only Quantan between Singapore and the various airstrips around Kota Bharu.

The Malayan climate is not particularly pleasant. There is an unvarying year-round temperature of between 75° and 85° in the shade and very high humidity. The rainfall is prodigious and mainly takes the form of torrential storms during which it is not unusual for an inch to fall in the course of an hour. All of this makes soldiering in the jungle uncomfortable, to say the least.

In this jungle-covered and undeveloped land the Security Forces are attempting to deal with a handful of thugs. To the general public it may have seemed strange that with so many Regular police, Regular troops, and units of the Royal Air Force available, it should not be possible to clean them up very quickly. When, however, the problems are fully appreciated, it would be false optimism to expect quicker results. It must be remembered that nearly half the population of the Federation is Chinese and that the greater part of them are immigrants who have no ties of allegiance and who are either paralysed by fear—for many hundreds of Chinese civilians have been killed—or who are sitting on the fence waiting to see whether Communism is going to swamp Democracy. As has been aptly put by one writer: "Catching Communists in Malaya is about as easy as looking for fleas in a sheepdog's coat."

Action by Security Forces

From the outset of the emergency until December, 1948, the Government Forces were on the defensive. In the main their action took the form of guarding vital installations and of keeping in operation tin mines, rubber estates, and other commercial interests essential to the life and economy of the Country. There were few troops and few police, and there was, in fact, very little understanding throughout Malaya of the gravity of the situation and the size and scope of the measures required to deal with it. The efforts of the Police and the Army were largely directed towards dealing with outbreaks of insurrection as, when, and wherever these ocurred. That is to say the initiative lay entirely with the insurgents.

This defensive phase was won and by January, 1949, it was possible for the Security Forces to take the offensive with the arrival of more troops and with the release of police from guard and other duties made possible by the raising of additional men in the Special Constabulary. From this time, when the initiative passed in some degree to the Security Forces, the graph of incidents of Communist-inspired outrages went down fairly steadily during the whole year.

In the course of 1949, two carefully pre-planned and methodical sequences of military operations were undertaken with a view to restoring order in parts of Johore. Both achieved considerable success at the time, but in each case the results were only temporary, since there was no adequate Civil Administration machinery to follow-up, take over, and maintain control once this had been gained by military measures. But by the end of the year a degree of security was achieved which was beginning to restore confidence and many people were, unfortunately, talking prematurely about the end of the emergency and the possibility of withdrawing troops and handing over entirely to the Police. What they failed to appreciate was that, from about the middle of 1949 onwards, events in other parts of the Far East were having an increasingly grave effect on Malaya. The growing success of Communism in China, followed by the almost complete overthrow of the Chinese Nationalists; Ho Chi Minh's successes in Indo-China; and in fact the general advance of Communism throughout the Far East, all gave a new fillip to terrorism in Malaya.

Communist propaganda made the most of their successes and this had an increasingly grave effect on civilian morale throughout the Country. By the end of March, 1950, it was clear that the situation had become more serious, and had actually deteriorated since the beginning of the year. Although the strength of the insurgents did not appear to have increased, they were becoming progressively more active.

General concern was being expressed in all quarters at the apparent failure of the Administration and Security Forces to make any real and lasting progress towards resettling the Country. As a direct result it was decided that a Director of Operations should be appointed, and Lieutenant-General Sir Harold Briggs was sent out to fill this post.

The Briggs Plan

The task which faced the Director of Operations was far wider than merely co-ordinating and stepping up the efforts of the Security Forces to combat the M.R.L.A., although this was certainly one of his functions. It was necessary also to bring the whole of the population under effective administrative control in order to give them that measure of protection which would restore their faith in the Government, with the object of gaining their co-operation. It was clear that any improvement in the situation would call for energetic administrative measures as well as a stepping up of police and military operations.

To deal first with administrative problems. The most important are the resettlement of squatters and the imposition by the Government of a series of emergency regulations designed to limit the amount of direct and indirect help given by the civil population to the insurgents. In brief, the major features of the Briggs plan are the bringing of the whole population of Malaya under effective administration, either by taking administration to the population or by bringing the population within reach of the Administration. The great aim is to provide the population with adequate security and thereby to encourage them to come off the fence and assist the Government. In particular, it is hoped that the steps that are being taken will encourage them to provide information about the terrorists, which is so badly needed.

The squatter problem is not, of course, a new one. It had been appreciated long before the arrival of the Director of Operations, but it had never been possible up to this time for the Government to tackle it effectively. Bound up with this resettlement of squatters is the question also of the closer settlement of the aboriginal Sakai, who abound in Malaya and who undoubtedly provide the terrorists with much-needed food and shelter.

On the operational side, General Briggs's aim is generally to build up the strength and efficiency of the Police and to increase the effectiveness of military and air operations. Following increased military action, it is hoped that any successes will be consolidated and made permanent by an effective administrative follow-up.

In the past the rather unco-ordinated security operations, which had been largely dictated by the unpredictable activities of the insurgents, had yielded little permanent result. As the basis of his military plan, therefore, General Briggs decided that the available military forces throughout Malaya should be reduced to the smallest possible holding framework, and that the surplus forces thus made available should be used to launch a progressive programme of cleaning-up operations, starting in Johore in the South, and working steadily up country towards the Northern frontier.

The overall aims of the Briggs Plan are, therefore, progressively to lower the insurgent potential, both directly by ground and air operations, and indirectly by denying them their sources of supply and support; to restore administrative control over the whole of the population; to regain the confidence of the people in the ability of the Government to govern; and finally, to persuade the large majority (particularly the Chinese element), who are now sitting on the fence awaiting the outcome

of the struggle, to declare themselves openly on the side of the Administration and to give it their support.

Progress of the Plan

In those local areas where resettlement has been completed, considerable improvement has been noticeable. This is borne out by the decrease in incidents, by terrorist efforts to hinder resettlement, and by statements in captured documents. In the more distant areas, progress is slow but it is definitely being made and there is an increasing desire for resettlement shown by those squatters who have not yet been resettled, and signs of satisfaction in those who have. But enemy incidents have increased considerably in those areas which have not yet been tackled and there is no doubt that the completion of the resettlement scheme, which is likely to take at least another eight or nine months, is a matter of the utmost importance.

OFFENSIVE ACTION

The Role of the Fighting Services

Turning now to the offensive side of the picture, I will deal first with the role of the Fighting Services.

As I have already said, all three Fighting Services are operating in support of the Civil Power.

(*a*) *The Royal Navy*

The Royal Navy provide coastal patrols with the object of preventing illegal seaborne entry and exit. In addition they assist with river patrols, troop movement, and, on occasion, coastal bombardment in support of the Ground Forces.

(*b*) *The Army*

The main task of the Army is the domination of the jungle fringes separating the terrorists from their potential supply areas. They also operate in deeper jungle with patrols up to company strength. Their object is to break up and destroy the M.R.L.A.

(*c*) *The Royal Air Force*

As far as the Royal Air Force is concerned, its role can be assessed in order of importance as air supply for the Ground Forces; photographic reconnaissance; close offensive support to the Ground Forces; offensive operations on targets beyond the reach and resources of the Ground Forces; and intercommunication.

In passing, I might mention that squadrons of the R.A.F. Regiment (Malaya) have been operating in the jungle under Army control. While this is, of course, outside their normal role, they have done very good work, and these jungle operations have undoubtedly been of great value to them, and their morale and *esprit de corps* has risen considerably in consequence.

As an airman it would not, I think, be appropriate for me to discuss army or police organization or tactics. For the remainder of this talk I therefore propose to confine myself to the work of the Royal Air Force in this campaign.

R.A.F. Operations

Before discussing the specific operational tasks of the Royal Air Force, I should, I think, point out that aviation in general is essential to Malaya.

I have already mentioned that communications are poor, particularly in the interior, and that nearly all the airfields are close to the coasts. On the other hand, there are a large number of small strips dotted about which are suitable only for light aircraft. Most of these strips have been constructed by the Army for use by Austers of their A.O.P. Squadron, a unit which is controlled operationally by the Army, but is under the Royal Air Force for administrative and technical control. These aircraft are used primarily for communication work and have proved not merely extremely valuable, but quite essential, to enable commanders and their staffs to move about the Country and to conduct their operations.

The provision of adequate airfields, capable of taking transport aircraft, is vital to the development of Malaya. Although plans are in hand for the construction of strategic roads, money, material, and manpower (not to mention the hostile operations of the terrorists), all make work of this nature difficult and prolonged. The same applies equally to the building of full-scale airfields, but this problem can probably be offset to a large extent by the introduction of small passenger-carrying aircraft which have a performance which will enable them to operate from the small Auster strips. Such aircraft are in existence and it is likely that a few will soon be sent out to Malaya for operation by a commercial concern. If they prove successful they are, I think, destined to play a big part in the opening up and development of the Country. They will also make a valuable contribution to the present campaign.

Flying conditions throughout the whole of this part of the World are mainly good, since there is virtually no fog, and rainstorms are very localized and usually cover only a few square miles. On the other hand, mist frequently spreads over the valleys in the early morning and cloud covers the mountain sides. This usually disperses during the morning, but from midday onwards cloud begins to increase and builds up into large masses of cumulus which often culminate in very violent thunderstorms with torrential rain. While these conditions seldom prevent any flight from " A " to " B ", they do, of course, make supply-dropping operations, particularly in mountainous country, difficult and hazardous, and also tend to interfere with bombing operations. However, problems of this kind can usually be overcome by suitable timing.

Air Supply

The most important role of the Royal Air Force in this campaign is that of air supply. Without air supply the depth of penetration of security patrols into the jungle would be limited by the amount of food and other necessities the men can carry on their backs. This would limit their operations largely to the jungle fringes, and the insurgents would know they were free from attack in the deeper jungle.

As it is, both the Army and Police know from experience that their patrols can at any time penetrate as deep as they wish into the jungle in search of the enemy, and can remain there as long as may be necessary. Preparation for receiving air-dropped supplies imposes no great delays on jungle patrols, since our transport crews have demonstrated their ability to drop supplies into the smallest of clearings or even, if necessary, through jungle canopy, and the proportion of supplies lost through mis-dropping or hanging up in trees has been very small.

It may be of interest to state that, during the course of the campaign, over 4,000 supply drops have taken place and more than 6,000,000 lb. in weight have been dropped. The accuracy achieved by the crews is remarkable when one considers

the difficult mountainous country in which they have to fly, and the weather conditions, which are frequently bad. There have, in fact, been only a little over 1½ per cent. of failures and this includes those packages which are dropped in such a position that they cannot be recovered by the men on the ground and also those drops when parachute failure has resulted in damage or loss to the goods inside the containers. In the film I am showing at the end of this talk you will see something of these supply-dropping operations.

Although only one of the Transport Squadrons is required at a time to meet the air supply requirements of the Army and Police, the remainder are, of course, continuously employed in maintaining the necessary internal and external air transport and communication services, the former including scheduled courier and ambulance services connected with the emergency in the Federation, and the latter long-distance services between Singapore, Hong Kong, Japan, Ceylon, North Borneo, and sometimes further afield to Australia and New Zealand.

Photographic Reconnaissance

The task which is probably second only in importance to supply dropping is that of air photography. The value of air photography as an essential supplement to the inadequate maps of the Country has been fully appreciated by the Ground Forces since the beginning of the campaign. Over the greater part of Malaya the only maps available are reprints of pre-war issues, and while the one-inch-to-one-mile sheets of the populated areas in the Western parts are tolerably accurate, the only issues to be had of Kelantan and parts of Pahang are to the scale of four miles to the inch and are of pre-war vintage. These are virtually useless to patrols working in the jungle, for although the most important ground features are shown with some accuracy, rivers are frequently found to have changed their course, many of the smaller features are either grossly misplaced or entirely omitted, and there still remain areas, notably in Trengganu and South Pahang, which appear quite simply on the map as "Unexplored."

To permit ground operations to be undertaken in this jungle country, extensive photographic cover is therefore required to overcome the handicap of these mediocre maps, and the Army Photographic Interpretation Section at Kuala Lumpur has already prepared from air photographs special maps covering more than 4,000 square miles of Perak and Kelantan. These are not intended to be to survey standard, but they have proved invaluable in many of the ground operations.

Photographic mosaics are also of great importance to the Air Force, and are essential for the planning of air operations and the target briefing of aircrews, for neither of which are the maps sufficiently reliable. Vertical photographs are normally carried by the crews of strike aircraft to guard against errors in target identification. Many hundreds of photographic sorties have been flown and the monthly average of prints is well over 80,000.

Air Strikes

I have relegated offensive air support to the third priority in the Royal Air Force tasks. I have done this because this is really not an air war at all. There are no strategic targets which can be attacked and the enemy has no lines of communication, no industrial organization, or, in fact, anything which really provides a worthwhile target from the air. On the other hand, in spite of these very obvious facts, I believe that air attack on the insurgents themselves, although they are rarely

visible from the air, does actually pay useful dividends and is justified by the results achieved.

Air co-operation in this campaign has grown from very small beginnings to something pretty considerable. In fact, the first air strike of the operations, which took place in July, 1948, was delivered by two Spitfires only. Later, on considerable reinforcements were received and strikes of quite considerable dimensions, which frequently include the use of flying boats, and even, on occasions, of Harvard trainers, have been carried out at a steadily increasing tempo. As an indication of the effort put out :— during three months in the middle of 1949, sorties totalled 273, whereas during the last three months of 1950 these had risen to 1,142.

Air strikes are of two kinds—pre-planned and immediate. Pre-planned strikes are normally those carried out in conjunction with some set operation mounted by Ground Forces, and they may be designed to drive insurgents in a certain direction into ambushes prepared on the ground. On other occasions, planned strikes are carried out against enemy camps which are thought to be occupied. Some of these operations are carried out by night and, in spite of the difficulties of identification, many of them have been very accurate.

Unfortunately, there is very little scope for what is understood by " immediate close support." This form of air co-operation can seldom be used against terrorists whose main strength lies in their mobility and who have no interest whatever in holding any particular piece of territory. Every operation carried out by the insurgents is planned with a view to avoiding contact with our Forces, and when we do succeed in coming to grips with them, the engagement rarely lasts for more than a few minutes before the enemy disperses. Even if support aircraft were in the air on immediate call, the time factor would seldom permit them to be brought on to the target before it ceased to exist. But, in spite of this, there have on occasion been successes from this type of operation.

It seems unlikely that the Air Force will be presented in this campaign with the type of target with which it is best fitted to deal. We are operating in a friendly country and the enemy comprises only a handful in comparison with the rest of the population. The greatest care must, therefore, be taken to ensure that the wrong people are not hit. Air strikes are generally acceptable in the vast jungle areas, subject only to safeguarding the Sakai, but unfortunately in these areas, it is as difficult for the Ground Forces to indicate a target as it is for the Royal Air Force to spot it for themselves. It is also difficult for the Ground Forces to find enemy camps or concentrations without being detected and giving the alarm, which almost invariably causes the enemy to move immediately. In fact, it is even difficult for the Ground Forces to pin-point accurately their own positions.

Information regarding enemy camps and concentrations is given by agents and by captured and surrendered terrorists who are usually unintelligent and who are unable to read a map or an air photograph. They even have great difficulty in giving a reasonably accurate description of the country or distances involved. It follows that the great majority of air strike targets that can be offered to the Royal Air Force are *area* targets. It is rare indeed when we have a target of a more precise nature.

Known Results

There is no doubt that the air is not in a position to inflict heavy casualties on the enemy in this type of warfare, but equally it is clear that the effectiveness of air operations cannot be assessed solely by the number of casualties inflicted. In

attempting to cast up the score several difficulties are immediately encountered. In the first place it is known to be the deliberate policy of the insurgents to conceal from the Security Forces knowledge of their casualties and to that end they bury their dead immediately and camouflage the graves. Also, in order to maintain morale within their ranks, it is a punishable offence for gang-members to discuss their own casualties, with the result that captured or surrendered terrorists can seldom reveal under interrogation more than they have themselves experienced.

Again, the nature of the terrain, or the time factor, may prevent any ground follow-up of air action, and in this connection allowance must be made for the physical impossibility of undertaking a 100 per cent. reconnaissance of possibly three or four hundred acres of thick jungle in any circumstances, even without the added complication of trees felled by air bombing.

Finally, reports are very seldom received concerning terrorists who are wounded and who die subsequently, although these must amount to a significant total in view of the conditions under which they exist in the jungle.

It will be seen, therefore, that the total casualty figures inflicted by the air can be no more than surmise, but if reasonable allowance is made for the difficulties of obtaining information, and for the ratio between those air strikes about which reports are received and those which yield none. the total may well be quite considerable.

The Value of the Air Contribution

Material results achieved by air action certainly appear rather disappointing. There has, in fact, been a considerable amount of criticism which has appeared in the Press in this country at the employment of Royal Air Force bombers in this campaign. There is, however, no doubt that air strikes have a notable effect on morale, not only of the enemy and on civilian waverers, but also they give a welcome boost to the morale of our friends living in dangerous areas and working on rubber estates and in tin mines. Only a few weeks ago, when I was on my way home, I was told by one of the passengers on the ship that he had recently been staying with a rubber planter. One morning a heavy air attack took place not far away. On hearing the bombing the planter said to him: "You know what we call that—'Planter's Music'."

Those who are in the best position to judge in Malaya itself are quite convinced that the employment of a bombing force in this campaign has been amply justified. My own opinion, for what it is worth, is that air action keeps the terrorists on the run and enables our Ground Forces to meet the enemy on *our* terms rather than on terms dictated by themselves. I feel quite certain that the success of ground operations depends to a large extent on action from the air, and I also consider that the casualties sustained by our own troops would greatly increase if air strikes were discontinued.

Casualty Evacuation

So far I have not referred to a type of operation which is becoming of increasing value in Malaya. This is the use of helicopters for casualty evacuation. When the helicopters were first sent out to Malaya there was no great optimism that they would prove successful in this very difficult type of country. It was considered doubtful whether their performance and range would allow them to do anything really useful, but these doubts have been shown to be largely groundless. The pilots have demonstrated that they can get down in the most incredible places and

can pick up the sick and wounded from the jungle and take them straight to hospital with the minimum of time and discomfort to the injured men. In spite of maintenance problems with this rather delicate type of aircraft, many successful casualty evacuations have been carried out and undoubtedly many lives have been saved by their use. Their effect on the morale of the troops in the jungle, who now know that if they are wounded or sick there is a reasonable chance of their being brought out rapidly to hospital, has been very considerable. I have nothing but praise for the work of the pilots of these helicopters and there can no longer be any doubt that this type of aircraft is invaluable in operations of this nature.

Conclusion

Malaya is vital to the British Empire and Commonwealth, both strategically and economically. It may well be regarded as the frontier of Australia and a bulwark against the spread of Communism. Its products of rubber and tin are essential to our economy. The Country *must* be held.

Life for planters and others in the dangerous areas has, for the past three years, been tough in the extreme. They have put up a most gallant show, but relief from ambush and murder must come quickly if they are to carry on.

The question is asked frequently—" Can this show be cleared up?" Much depends, in my view, upon events in countries bordering Malaya, and in the Far East in general. Providing there is no further deterioration, and I suggest there has been marked improvement in recent weeks, then I have little doubt that this campaign can be brought to a successful conclusion. There are, of course, many problems still to be solved by the Administration, but these problems are being tackled energetically and in a realistic manner. Many of the difficulties are being overcome and success may well be achieved in a measurable period of time. But external events are the unknown factor, and it is on them that the answer must largely depend.

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A film showing the Royal Air Force in operation in Malaya was shown.

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DISCUSSION

Major F. H. Howard: There are two questions which I should like to ask. First of all, with regard to supply dropping, it must be difficult sometimes to find the dropping zone. Do the aeroplanes carry radar and do the ground patrols carry any form of radio device?

Secondly, do you know to what extent, if at all, the terrorists' tactics are directed from Russia? There must be some co-ordinating authority.

The Lecturer: With regard to the first part of the question, the aircraft do not carry radar and radio is not used to any great extent, but it depends to a large extent on the type of dropping zone. If the patrol is able to find a suitable open space, they put out fluorescent panels. Then they pin-point their position, pass it back to their base, and the aircraft finds its way to that position by dead reckoning, map reading, and so on. When the aircraft gets near the area, it circles around and the patrol on the ground let off smoke candles, if they have any. If they have no smoke candles, they fire off Verey lights. Some of the drops which you saw in the film were through trees, since those particular patrols were in country which did not provide an open space for a dropping zone. It may not be possible for the patrol on the ground even to get smoke up through

the trees. In those conditions sometimes—not always—they are able to get in touch with aircraft by R/T. The small sets which they carry when on jungle patrol have very short range in the jungle, but have rather better range from the ground to the air. A patrol of that kind, which has to be supplied through the trees, may be carrying a wireless set and may be able to talk to the aircraft if it is carrying the complementary R/T set. But comparatively few drops are done in that way, the normal procedure being to drop onto a prepared dropping zone which can be seen from the air.

So far as the second question is concerned, I do not think that there is any direct evidence at all. It is possible that the Malayan Communist Party is in touch with Russia, but I really cannot say. There has been no direct evidence of that, as far as I know.

COLONEL MAKGILL CRICHTON-MAITLAND : Can you tell us how far the Administration has become effective as yet ?

THE LECTURER : Progress of the plan is rather behind schedule, and it is too early to say that the Administration has obtained full control anywhere. The resettlement of squatters has only recently started. There are many thousands of squatters, but fortunately many of them will not have to be resettled, since they are in areas which are already under control. Some 80,000 or 90,000 will have to be resettled, and I think that about 20,000 have already been brought under control. There are thus large numbers not yet under control. Although the plan of working up from the South has been put into effect, I am afraid that even in Southern Johore no area can yet be said to be fully under control.

LIEUT.-COLONEL H. D. ST. G. CARDEW : Would the Lecturer tell us what arrangements have been made for watching or closing the Siam/Malayan frontier, the proverbial back door of Malaya ? It seems to me that a lot of rice and ammunition may be floating through that back door.

THE LECTURER : There is a close liaison between the Federation police and the Siamese police, and I understand that the latter are co-operating very well. There is no evidence that very much is coming across the border. It is very difficult country and the Siamese police on the one side and the Federation police on the other are keeping the border pretty well closed.

CAPTAIN A. R. FARQUHAR, R.N. : As many of these people are Chinese and not British subjects, would it not be quicker and cheaper to deport them ?

THE LECTURER : Yes, it probably would ! It is one of those things which should, I think, have been tackled more seriously in the very early days. It is too late to deport them now to China. They would not be accepted by the Chinese Communist Government. But there are many thousands of detainees that must be got out of the country, and all I can say is that it is a problem which is exercising the Government very considerably.

MAJOR R. D. WILSON : The lecturer said that the losses due to parachutes getting hung up in trees were very small. From the film it seems as though a large quantity is dropped into fairly thick jungle, and I cannot understand why more is not lost. Is there a particular drill employed by the ground troops for climbing up the trees or are they equipped with any devices for releasing supplies which do get hung up ?

THE LECTURER : Dropping through the trees is not a very common practice. In the great majority of cases there is a cleared dropping zone and accuracy is such that the aircrews do not often miss it.

On occasion trees have to be cut down to enable patrols to reach the containers. Some patrols carry special devices, such as motor-driven saws, for cutting down trees, but this is not the general practice. But they seem to have their own ways and means of recovering containers held up in the trees, and not many are lost.

CAPTAIN D. GILMOUR, R.N. : When a patrol goes out into the middle of the jungle, does it stay there a fortnight or three weeks and, if so, what is the system of relieving the patrols, by road, air, or a mixture of both ?

THE LECTURER: The patrol may be out in the jungle for a fortnight or three weeks, sometimes even longer, and they make their way back to the base area on foot. When a unit is due for rest, it is brought out by road from its base.

SQUADRON LEADER P. A. C. MCDERMOTT: The nature of the terrain would seem to indicate that slow aircraft would be more suitable, yet I understand from the Press that jet aircraft are to be used.

THE LECTURER: I agree. Unfortunately we are getting to the state where we shall have no aeroplane which is really very suitable for this type of operation. It does not require a jet fighter for a job of this kind. Jets were sent to Malaya not directly for work in this campaign. They were sent there for the air defence of the Country. On the other hand they can be as effective as the Spitfire for this type of work except that their range is not very great. But I do not think that will worry us very much. The type of aircraft which is probably most useful is the Brigand. It does remarkably well, but unfortunately the Brigand is coming to the end of its life and I do not know what will replace it eventually. I do not know how long the Brigand will go on. The need we have is for a really effective replacement for the Brigand. Of course, the Spitfire and the Tempest both do very well, but the Spitfire is almost dead and the Tempest is dying. The Tempest is to be replaced by the Hornet and I think that will do the job very well indeed.

THE CHAIRMAN

In summing up this excellent exposition of the problem in Malaya, both in the lecture and the discussion, I would like for a moment to refer to the broader canvas of South-East Asia and the Far East. It is, indeed, all one problem and it is impossible to discuss, whether it be Malaya, Indonesia, or French Indo-China, without consideration of that broader aspect. Events in China, for example, have powerful reactions in French Indo-China as well as in Siam and Malaya—and troubles in Indonesia have repercussions in Malaya. What it amounts to, in fact, is that a new era in Asia is in full flood. The whole of that great region, containing more than half the population of the world, is changing profoundly. The significance of the change, and the reason why it is irrevocable, is that it is brought about by a deep and revolutionary movement of the peoples of Asia. That movement, that powerful conviction, is a composite of two dominant ideas: first, the revolt against misery and poverty as the normal condition of life: and second, the revolution against foreign domination. These ideas meet and fuse in the positive conception of national independence. It is, therefore, a matter of no surprise that the Communists should believe that Asia is as good a happy hunting ground as any in the World to-day.

We have to recollect that while the transformation in Europe since 1939 is great, in the Far East it is greater. In Europe the various Sovereign States of more or less national entities still exist, but, excluding China and Japan, all of those countries once under the sovereignty of either Britain, France, America, or Holland are now either independent, struggling for it, or looking forward to the day when they will get it. Asiatic nationalism is on the move, and in Malaya we are witnessing just one of its many reactions and effects.

In Malaya we are faced with a tremendously difficult problem—not a man-made problem but a problem of the jungle. There is no jungle in the World like it, either in magnificence or in inherent strength. It is impenetrable. For example, an aeroplane was once lost, and though its location was known within a square mile, a whole battalion took just a week to find it. The Malayan jungle covers 72 per cent of the Country. Every habitation is within a few hours walk of it, and when in the jungle it is sanctuary. In other words, an ideal country for the thug, the bandit, and the insurgent.

To that problem we must add that of the squatters on private land, reserved forestry, or land reserved for Malay development. There are between 500,000 and 600,000 of them, almost all Chinese. Many, dispossessed of their livelihood on the Japanese occupation, squatted where they could and have not returned to their pre-war occupations: many were there before the War, and quite a great proportion of the areas in which they squat

has never been administered. The people have never known any government, or official, or policeman. The consequence is that it is impossible to know friend from foe—one moment a man is looking after his plot of land or busy in his shop and the next moment he is handling a rifle. In addition, the bandits or insurgents can and do apply pressure on the hundreds of these small communities for food, money, shelter, and intelligence.

It is therefore—as the Lecturer has so forcibly indicated—a most difficult problem. Under such conditions the role of air forces must be secondary to that of the man on the ground, whether he be the soldier or the policeman—but first and foremost the job is mainly that for the policeman. The aeroplane does play, and has played, a very great part in air transportation and reconnaissance, but what appears to be debatable is the extent of the value of direct air action. This, however, suffers in the same way as action on the ground, in the general lack of a definite target. I am sure, nevertheless, that direct air action is of very great value and, the problem being what it is, we should use every weapon at our disposal whenever possible. It may achieve small dividends, but every little helps in a campaign of " Blind Man's Buff."

There has been much progress in the last six months towards putting an end to the campaign but it would be unwise, I think, to expect quick results. Even now it may take longer to restore stability in Malaya than we care to admit. It is, of course, of the greatest importance to eliminate the insurgents at the earliest possible moment, so as to release our fighting units, to restore the economy of the Country, and to aim at increasing the standard of living and education, and nothing must stand in the way of achieving that object. Much will depend, I think, on the speed, drive, and determination behind the resettlement of the squatters and in bringing them under a firm yet benevolent administration.

All that is now left for me is to thank the Lecturer on your behalf for his most interesting and instructive lecture, and to thank him also for his film which showed us clearly the difficulties of geography in the endeavour to kill off the insurgents. (*Applause.*)

THE WAR IN THE PACIFIC, 1944

LEYTE ISLAND AND MINDORO[1]

By Lieut.-Colonel H. E. Fooks, O.B.E.

The last article in this series, published in the Journal *for February, 1951, dealt with the fighting in the Pacific during the advance from Guadalcanal to Leyte Gulf. It concluded with the decision, endorsed by the Quebec Conference, to put forward by two months the planned date for the invasion of the Philippine Islands, from 20th December to 20th October, 1944.*—Editor.

LEYTE ISLAND

On 20th October, 1944, General MacArthur's amphibious force, under cover of a heavy naval bombardment, commenced landing in the Philippine Islands. Admiral Halsey's Third Fleet, supported by Admiral Sprague's escort carriers, supplied the air cover, and Admiral Oldendorf's battleships carried out the bombardment. Halsey came under the command of the C.-in-C. Pacific, and Sprague was under Admiral Kincaid, the commander of MacArthur's fleet, which comprised all ships in the amphibious force.

Of the Philippines, out of which MacArthur had been driven in 1942, the first objective to be chosen was the north-eastern end of Leyte Island, which forms the western side of San Pedro Bay. Leyte is 100 miles in length and about a third of that in breadth. It is a hump-backed island, being divided lengthways from North to South down the centre by a range of rugged, extinct volcanoes which rise to over 4,000 feet in height and are covered with thick tropical jungle. At the northern end are two valleys. Of these, Leyte Valley, on the North-East, runs from Carigara to Tacloban. The other, Ormoc Valley, lies between Carigara Bay to the North and Ormoc Bay, on the West coast, to the South. The valleys are separated by a range of rugged mountains.

The reasons for selecting Leyte were as follows :—

(*a*) The East side had advantages for amphibious landing. It had good harbour facilities in San Pedro Bay and it was undefended.

(*b*) It had easy access to other islands and it commanded the approaches to Surigao Straits. By its occupation, the enemy forces to the South in Mindanao would be isolated.

(*c*) Intelligence reports showed three or four airfields on the island, which would enable an army air force to operate and so ensure air cover for the occupation force.

Unfortunately, during the latter months of the year, the monsoon blows, the rain pours down, especially on the East side of the mountain ranges, and the ground is turned into a swamp.

MacArthur accepted the disadvantage of roads and airfields being put out of action by the monsoon. His C.R.E., however, told him that, within five days of landing, his men would have all airfields in working order, and MacArthur took him at his word. During the five days he would rely on Halsey's carrier fleet and his own (Sprague's) escort carriers to provide air cover for the Army on shore. As soon as the fields were ready to operate, he would bring up his own Army Air Force from Morotai, 600 miles to the South, and thus release Halsey's fleet to carry out their

[1] *See sketch-map facing page* 424.

chief task. This was to harry all enemy airfields up and down the Philippines, from Formosa in the North to Mindanao in the South, and to destroy as many hostile machines as possible, either on the ground or in the air.

The landing beaches chosen were those of Leyte Valley. Thanks to the covering bombardment, which was very heavy, enemy resistance to the landing was small. In fact, at Tacloban, the headquarters of the 16th Japanese Division, the troops panicked and fled, leaving enormous dumps of stores and munitions to fall into Allied hands.

The Landing

General Krueger commanded the landing force, known as the Sixth Army. It consisted of two corps, each of two divisions. They were X Corps (1st Cavalry Division (dismounted) and 24th Infantry Division), and XXIV Corps (7th Infantry Division and 96th Infantry Division).

As soon as the beaches had been secured, Krueger sent a force across the narrow Juanico Straits to watch the southern area of Samar, and at the same time sent an amphibious force by sea to Carigara and occupied it. Farther to the South, the 24th Division penetrated into the mountains and took the towns of Dugami and Burauen. The southern part of the island was left to the Filipino guerillas, who had been in control of that area for some time before the Sixth Army landed.

It was very soon discovered that the report about there being good airfields on the island was not correct. There was a small civilian air-strip at Tacloban, but this had been ruined. Its surface, already soaked by rain, was cut to bits by the Army using it as a parking ground for their mechanical vehicles as they were brought ashore. At Dulag there were two or three strips. These the Japanese had started making, but had never completed. They were now so boggy as to be only fit for growing rice. The Engineers did their best, but it was soon obvious that the suggested five days was an under-estimate. To complicate matters, the roads in the area, under the traffic of four divisions, soon disintegrated and the resources of the Engineers were consequently overstrained. In spite of modern equipment, nothing very much could be done until the monsoon stopped. "Mud is still mud," reported the Commander of Engineers, Major-General Whitehead, "no matter how much you push it around with bulldozers."

The Japanese "Sho" Plan

Long before the five days were up, another problem arose which put all others in the background. This was the news that the Japanese had ordered their "Sho," i.e., Victory, plan to be put into operation. It resulted in a week's heavy naval action, known as the Battles for Leyte Gulf. As these have already been described in full[2], it will suffice to quote Admiral Halsey's despatch to Washington. "In the course of protecting out Leyte landings," he wrote, "the back of the Japanese fleet has been broken."

During the battle, the Air Forces of both sides had too much to do to worry about Leyte Island. It so happened, however, after the Battle of Samar, when Kurita's fleet surprised Sprague's escort carriers, sank three of them, and then as suddenly withdrew, that 67 homeless carrier planes were forced to land on Tacloban. This strip was a bog, and the result was that 20 planes crashed on landing. The sappers, within the next two days, managed to lay 1,200 yards of steel wire at

[2] *The Battle for Leyte Gulf*, R.U.S.I. Journal, No. 573, February, 1949.

Tacloban, which allowed 34 of MacArthur's army bombers to fly in from their base at Morotai and land without damage.

The Enemy Appreciation

Let us turn to the Japanese and look at the situation as they saw it.

In April, 1944, Field-Marshal Count Hisaichi Terauchi was in command of the Army of the whole of the Empire of Conquest. This included all troops in the Philippines, Dutch East Indies, Borneo, Malaya, Indo-China, Siam, and China. From his headquarters in Manila, he controlled 17 different Armies which numbered just under 1,000,000 fighting men. Terauchi was a "Jingoist," an ex-Minister of War, and had commanded the Japanese Army which had invaded China in 1937.

A month or so before Leyte, Terauchi's staff prepared an appreciation of the situation for him. The following extract shows their ideas about the future Allied plans.

"A two-pronged attack on Luzon is planned. MacArthur's Army, supported by Admiral Nimitz (C.-in-C. Pacific), will advance in the Southern Philippines. The other attack will be on the Northern Philippines from the Pacific. Part of Nimitz's force will co-operate with MacArthur, while his main force will be prepared to engage our Navy in the Luzon–Taiwan (Formosa) area and overcome any resistance. Kenney's (MacArthur's) Army Air Force will overcome air resistance over the Philippines and, with enemy air forces in China, will operate over the China Sea to isolate these islands."

Terauchi realized that the situation had changed since that had been written. MacArthur had landed on Leyte, and if that island remained in Allied hands he would, in spite of the 250,000 Japanese troops in the Philippines, overcome resistance and recapture the islands. The fleet, to which Terauchi had looked for support, was scattered and the Air Force left at his disposal was badly battered. Thanks to Halsey's attacks on air bases in Formosa and Luzon, the Air Force was very short of trained pilots and of planes.

Terauchi decided that it was a case of now or never. He decided to fight the decisive battle for the islands on Leyte.

A Change in Leadership

His first action was to relieve General Kuroda, who commanded the Fourteenth Army responsible for the Southern Philippine area, and to replace him with one of Japan's most popular and successful generals, the man who took Singapore and who forced MacArthur and the U.S. troops out of Bataan. This was Yamashita, who commanded the First Army area in Manchuria.

Yamashita's ideas of where to fight the decisive battle did not coincide with those of Terauchi. According to his Chief of Staff, General Nishimura, he wanted to fight a delaying action on Leyte and prepare for the decisive action in Luzon. Nishimura agreed with him and said—after the War was over—that if Yamashita's plan had been tried it would have delayed the end by at least six months, and that the masses of men and stores which were poured into Leyte and were eventually lost would all have been saved.

However, Yamashita obeyed his orders. He sent the following message to General Makina of the 16th Japanese Division (the formation that had failed to hold Tacloban and that lost all its stores): "The Army has received the following order

from H.I.M. The Emperor. 'Enemy ground forces will be destroyed.'" What Makina's thoughts on the subject were, when he got the message, history does not relate.

Reinforcements were being collected from all over the Japanese Empire, and from wherever they could be spared. All throughout the naval battle for Leyte Gulf, Japanese troops were being convoyed to, and disembarked at, Ormoc Bay.

The amphibious force which had been sent by General Krueger to take Carigara had moved on to the West to Limon, from where they advanced South towards Ormoc. To their surprise they found that Ormoc Valley was full of enemy troops, who pushed them out and back to Limon much quicker than they had advanced. The Japanese, having cleared the valley, took up a very strong position across the northern end, where there was a natural barrier of rugged hills, known as Breakneck Ridge, which commanded the entrance. Yamashita's plan was to take the area of Carigara Bay, use it as a second disembarkation harbour to Ormoc Bay, and then, when he felt that his Army was strong enough to do so, attack East towards Tacloban, using Carigara as a jumping-off ground.

The Battle of Leyte Gulf finished on 26th October, by which date the four original divisions of the U.S. Sixth Army had been increased to a force numbering 167,000 men. It is not possible to give the strength of the enemy at this time, but it was increasing daily, and could not have been far short of that of the Allies.

Thanks to the efforts of the Engineers at Tacloban, there were 34 army bombers on the strip, the remainder being at Morotai, a long 600 miles to the South. The enemy had lost most of their Navy, and their Air Force had also had considerable losses, but they still had plenty of planes left. As these were based on fields in Luzon, they were able to do considerable damage to Krueger's Army. His supply dumps were bombed and the convoys bringing fresh supplies were caught and damaged at sea.

Difficulties of Air Cover

Halsey's carriers and Sprague's battered escort fleet, now not quite so strong as it was, did all they could to give air cover to the soldiers on the beach. These two fleets had been fighting hard throughout the week and were now, if not exhausted, very tired. Apart from losses sustained in action, which had not been light, crews needed rest, and the aircraft required overhaul. In addition, munitions were running low and the ships themselves needed refuelling and repair.

Both Halsey and Sprague reported the state of their fleets to MacArthur, and asked for a date when the ground Air Force, based on Morotai would be prepared to take over the task of giving air cover to the Sixth Army. MacArthur, on the strength of his 34 bombers on Tacloban air-strip, gave orders that the Army would take over air cover from 28th October. It was easy enough to give the order, but quite another thing to carry it out.

The 34 planes did their best to stop the influx of Japanese reinforcements into Ormoc Bay. They attacked convoys and did considerable damage to them. When they were lucky, they caught the convoys with their troops on board. Some were able to swim ashore, but a large number could not, and at any rate their equipment would all be sunk. If they were not lucky, the bombers had to be content with attacking convoys which had just disembarked their cargoes of men and stores, but even empty transports were a prize, for the enemy had none too many of them left.

But the bombers themselves were not invulnerable and they, too, had suffered

severe losses and were very low in number. It was soon obvious that if command of the air were needed, the Army Air Force, handicapped as it was by lack of good landing grounds within easy flying distance of Leyte, would not obtain it.

Halsey came to the rescue. He had three divisions in his fleet and sent away two of these to Ulithi, an atoll 900 miles due East of Leyte, to rest and repair, and kept one division. But he took care to strip the two he sent away of all planes, munitions, and fuel, which were not considered absolutely essential for their defence. With these, he equipped seven carriers, which he formed into two carrier divisions, and continued to give MacArthur the air cover he so badly needed. This made all the difference and the figures of enemy convoy losses went up appreciably. For example, one convoy was caught in San Isidro Bay and six transports, three destroyer escorts, and four destroyers were sunk. Air battles increased in intensity, but in spite of the enemy moving their air bases from Formosa to Luzon, the advantage lay with the Allies. They could replace their lost pilots and their planes, whereas the enemy were not able to do so. Pilots need a considerable time before they become skilled, and planes cannot be repaired without spare parts.

Owing to the very efficient blockade of the China Sea by Allied submarines, essential minerals used in aero manufacture, such as bauxite, and fuel were prevented from entering Japan. They were badly needed to replenish her pre-war supplies, which were nearly exhausted, and their loss had a crippling effect on the Japanese effort at Leyte.

Birth of "Kamikaze"

The Japanese retaliation to superior Allied air power was remodelled to suit the situation and the temperament of the nation. Something had to be done to save the loss of good pilots and expensive machines. More use had to be made of untrained men, and cheaper, expendable machines for their use would have to be produced.

A special attack unit was created, known as *Tokko Tai*, and the machines were called *Kamikaze* or Divine Winds. The name was based on the old legend when, centuries ago, a divine wind had sprung up and saved the Japanese fleet from disaster at a critical moment.

"The life of the warrior is as the cherry blossom which blooms for a few days in the spring and then falls to the ground." So wrote a great Japanese poet, and that was what was imbued into the volunteers who joined this *Tokko Tai* force, all sworn to die for their Emperor. The pilots, not always fully trained, flew light, expendable, fast planes, each armed with a heavy bomb, not merely over, but into their target. Unless shot out of the sky by anti-aircraft fire, they could follow all avoiding action taken by the vessel chosen as their victim, and when they hit or landed on it, the bomb, pilot, and ship blew up together.

These *Kamikazes* sometimes attacked singly, at other times in swarms. Very few ever returned, but after all, what did that matter? A ship, if it were small like a destroyer, would be sunk when hit, a big one would be badly damaged, and suffer heavy casualties in personnel. The cost to the Japanese was one expendable pilot, bomb, and plane. Several Allied ships fell victims to this new form of attack. Some were sunk and many were severely damaged. Once a *Kamikaze* had penetrated the air cover provided by the Allied planes, the only defence against it was rapid avoiding action and straight shooting. As any anti-aircraft gunlayer will tell you, the two do not combine.

In spite of the defence put up by their Air Force, the enemy continued to take

very heavy losses of convoys bringing in reinforcements to Ormoc Bay, but at the same time large numbers of troops and supplies were landed. In November, it was learned that some of the best of the Japanese divisions, including the 1st " Victory " Division (Imperial Guard Division), which up to now had been in China, had reached the island. It was also noted that convoys coming to Ormoc were often made up with sailing junks instead of transports. All told, 25 transports had been allotted to the expedition, and of these more than half had been sunk.

The Captured Plans

The fighting on land became daily more severe. Krueger kept pounding away at Breakneck Ridge, the northern gate to Ormoc Valley, but he was not able to make much headway there. About the middle of November, a major on the staff of the 1st Japanese Division was killed near Jaro. The 24th U.S. Division, in clearing up the ground, found an operation order on his body which gave away Yamashita's plan of attack. The plan, already described, could, in Krueger's opinion, be countered, provided that Krueger could retain the initiative. This he intended to keep.

Krueger decided to hold the enemy at Breakneck Ridge while XXIV Corps worked its way Westward through the mountains to the coast, as the 7th Division on his left flank had already done. The Corps would then wheel right and move North on Ormoc. At the same time an amphibious force would land in Ormoc Bay.

The ground fought over was thick, sticky mud. Wheeled traffic was impossible as vehicles got bogged. Ammunition and supplies had to be carried by hand and the wounded evacuated on stretchers. This is not an unusual feature on a battlefield, especially in areas not far from the front line. But on Leyte it had to be done everywhere. Fortunately the Filipinos were friendly and they volunteered in large numbers to do the carrying.

By 1st December, Krueger's original force of four divisions had risen to seven, all well established and ashore. The Engineers had, after much strenuous labour, produced five good air-strips, and MacArthur's Army Air Force was able to operate from these instead of from Morotai.

Japanese resistance was still very stiff, but there were signs that it was beginning to crack. On 7th December, the U.S. 77th Infantry Division, newly arrived, was landed south of Ormoc, where it joined up with the 7th Division and advanced on that town. Four days later, Ormoc, the chief supply centre of Yamashita's Army, was captured with all its stores. Field-Marshal Terauchi and all his staff left Manila and fled to Indo-China. Yamashita flew to Manila and Japanese resistance was gradually pressed out. In the words of the Chief of Staff, General Marshall, " It was at Kilometre 79, on the Ormoc Highway, that the Japanese 1st Division command post, defended by 500 exhausted, defeated soldiers, made the last stand." That was on 21st December, 1944, though it took a further six months to clear up the remaining Japanese on the Island.

Casualties for the two months' fighting were :—

	Killed	*Wounded*	*Prisoners*
United States (Allies) ...	3,000	10,000	
Japanese...	56,000	?	389

We may add another 25,000 Japanese, killed and captured, during the six months of clearing up.

Tasks of the Navy

After the naval battle for Leyte Gulf in the last week of October, 1944, the scattered Japanese Navy was too busy being repaired to be of much nuisance value. On the other hand the Allied Navy was well employed. Its chief tasks were :—

Harrying enemy aerodromes from Formosa Southwards to Mindanao.
Protecting their own and destroying enemy convoys.
Providing air cover for the Army on Leyte.
Enforcing the submarine blockade in the China Sea and so stopping supplies of fuel entering Japan from Borneo, and of munitions reaching Malaya from Japan.

During the two months following the destruction of the Japanese fleet, the greatest loss suffered by the Allied fleet was not from enemy action, but from storm. A typhoon caught Halsey's Third Fleet while refuelling from tankers at sea on 17th December. The barometer dropped and the sea rose. Fuelling operations had to be cancelled and the fleet was ordered to make for shelter. The storm increased until escort carriers found themselves rolling 45 degrees, while destroyers were doing 70 degrees each side. This was far more than their constructors had allowed for and resulted in the total loss of three destroyers, which capsized.

The damage to all ships was considerable and several had to make for Pearl Harbour to undergo major repairs. Nearly 150 aircraft were blown overboard from the carriers and the loss of officers and men drowned amounted to 800. The barometer recorded a low of 27.3 inches and the wind a force of 110 knots. In Great Britain, the lowest height line on a barograph is 28 inches, and the lowest reading ever recorded is 28.35 inches.

MINDORO

While Leyte Island was being cleared of defeated, but still resisting, groups of Japanese, MacArthur was making his next bound towards Manila. This was to Mindoro, an island slightly larger than Leyte, on the West side of the Philippine Archipelago, just South of the main island of Luzon.

Being on the West side, in contrast to Leyte which was on the East, the monsoon, which converted the latter island into a bog, hardly affected the former. Mindoro remained dry and the airfields on the island were not hampered by low rainclouds, as was the air-strip at Tacloban. MacArthur had no intention of occupying the whole of the island. All he needed was a small area around the town of San Jose, in the South-West tip, an area big enough for his army air force to operate against Luzon.

Elaborate precautions were taken to conceal his intention from the enemy. Guerilla forces on Mindoro were ordered to remain inactive, so as to lull the enemy into security, and the carriers under Halsey were asked to leave the island untouched. The result was that the Japanese were bluffed, and as reinforcements were badly needed by their Army on Leyte, the garrison on Mindoro was reduced to under 1,000 men, distributed in small detachments around the coast.

The force detailed for the attack was under the command of Rear-Admiral Struble. He commanded three groups, which consisted of a transport group of 1 light cruiser, 12 destroyers, 9 destroyer escorts, 43 landing craft and 16 minesweepers; a close covering group of 3 cruisers and 7 destroyers; and a motor torpedo boat group of 23 P.Ts. This force was accompanied by a heavy covering carrier group

under Rear-Admiral Ruddock, consisting of 6 escort carriers, 3 old battleships (15 inch—18 knot), 3 light cruisers and 18 destroyers. The task of this group was to provide air cover for the whole fleet from the time it left the area covered by the Army Air Force on Leyte. A second task was to deal with any fleet that the enemy might manage to scrape up to attack the convoys.

The assault troops, under the command of Brigadier Dunckel, consisted of the combat team of the 503rd Parachute Regiment and the combat team of the 19th Infantry Regiment. Both of these units were from the 24th Division, which had been disengaged from the fighting on Leyte for this attack. Unfortunately, the state of the air-strips on Leyte did not permit the Air Force to handle the lift of the Parachute Regiment, and it had to travel by sea.

The force set out on 12th December, and for the first few hours, until darkness fell, all groups steamed on different courses to that of their real one. As soon as it was too dark for enemy coast watchers to see, course was altered for Mindoro. The next afternoon the fleet was spotted by the enemy (it was never more than 15 miles from land). About 3 p.m. on the 13th, when the ships were approaching the southern tip of Negros, at the eastern end of the Sulu Sea, a single hostile plane was seen mast-high, close on top of the fleet.

This *Kamikaze*, untouched by the belated fire which was opened on it, landed on the " Nashville," a cruiser which was Struble's flagship. It struck just abaft the bridge, where it blew up. One-third of the ship's complement of 1,000 men were casualties, of whom 135 were killed. Brigadier Dunckel, who was occupying MacArthur's cabin on board (MacArthur himself was at his headquarters at Tacloban, but the " Nashville " was his headquarters ship) was badly burned. Struble escaped untouched, but both his staff and Dunckel's suffered severely. Practically all of Dunckel's, including his Chief of Staff, were killed, while Struble lost his Chief of Staff and his P.M.O. The commander of the air force bomber group also lost his life. Struble and the Brigadier transferred to a destroyer, and the " Nashville " was sent back to Leyte for repair, soon to be followed by a destroyer, which narrowly escaped being sunk in a later attack the same afternoon.

Course was altered by the fleet, this time towards Palawan. The enemy on that island had been badly bombed the day before by Halsey's carriers so that, on seeing the fleet approaching, they were convinced that they were the next objective and acted accordingly. This resulted in a terrible tragedy.

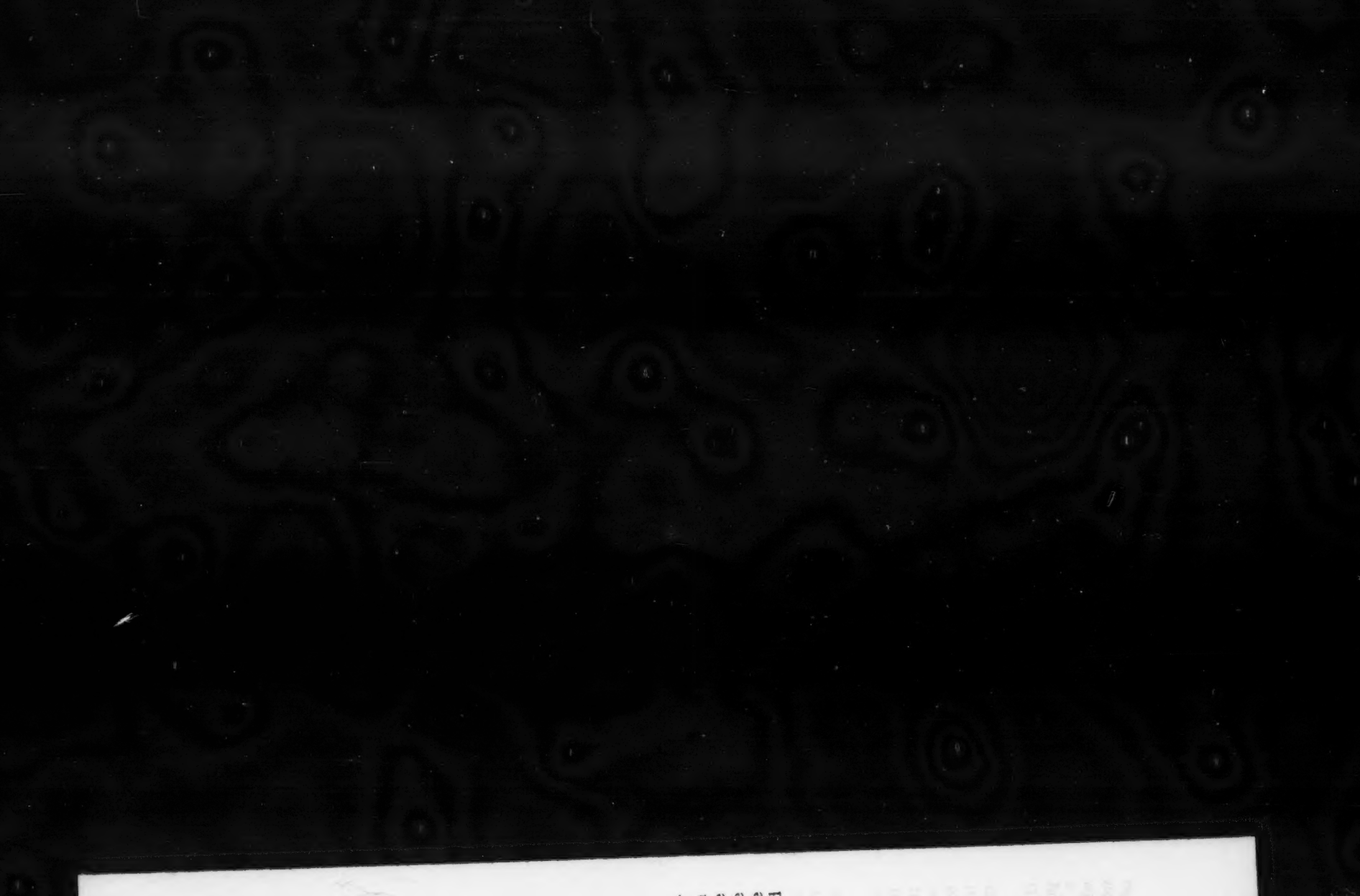
On Palawan there was a prisoner-of-war camp, in which 150 Allied soldiers were confined. These men were employed by the Japanese in the construction of an air-field on the island. On the approach of the Allied fleet, the prisoners were herded into a cave used as an anti-aircraft shelter. There they were soaked with petrol and set alight, any that attempted to escape being shot down. Three somehow managed to get into the sea, and when they finally came out, their lives were spared. The remainder were incinerated or shot. When the Allies finally captured the island some months later, the bones were found in the cave.

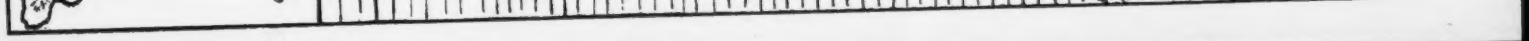
Struble's force reached San Jose two days later and were greeted by crowds of cheering Filipinos on the beach. As a naval bombardment had been arranged as a preliminary to the landing, the Filipinos had to be warned to go away. Then followed a ten-minute bombardment by the guns of the covering and carrier groups, after which the troops landed. There was no opposition. All stores having been landed, work was at once started on the airfield, which was in bad repair, as it had not been used since the Japanese had captured it.

Although the Japanese military forces on Mindoro were not able to worry the 12,000 Allied troops occupying the area around San Jose, plenty of trouble was caused to them and to the fleet which had brought them there by the enemy's Air Force. Manila was well under 200 miles away, and all round Manila there were excellent airfields full of Japanese planes, both naval and military. These came over daily and caused a great deal of damage. The fleet, as soon as it had unloaded the army's stores, weighed and left for Leyte. The *Kamikazes* followed it up, and damaged several ships. Convoy duty between Mindoro and Leyte was not popular, owing to the attention given to the ships, both coming and going, by enemy aircraft. On one occasion, the *Kamikazes* sank six ships, including three destroyers, an oil tanker and a transport loaded with ammunition.

On Christmas Day, news reached Leyte that a Japanese fleet was approaching Mindoro. Admiral Chandler, with four cruisers and several destroyers, sailed at once from Leyte in the faint hope that he might intercept it. On the 26th, Dunckel stood to arms to repel a landing force which was reported to be on its way from Luzon. At about 4 p.m. that afternoon, a hostile fleet, reported as one battleship, one cruiser, and six destroyers, was seen approaching Mindoro. The only naval units defending the island were those of the motor torpedo boat group, small wooden boats carrying a crew of 11 men and armed with torpedoes and machine guns. This group put out to sea to contact the enemy, and at the same time all available aircraft attacked. The m.t.b. group met the enemy as night was falling and, as the Japanese ships were being attacked by Allied aircraft at the time, were forced to keep clear to avoid being hit by their own side. A very muddled fight took place. The enemy steamed along the coast, shooting it up without doing any great damage, and were followed by the m.t.bs hard on their tail, waiting for an opportunity to attack.

About midnight the attack came off. One destroyer was sunk and another badly damaged. The enemy steamed away in the darkness and was never seen again in the Philippines. Admiral Chandler's fleet arrived the next day and, owing to the danger from *Kamikazes*, returned at once to Leyte. Except for attacks from hostile aircraft, Dunckel's force was not molested. It remained on the island, building large airfields for MacArthur's bombers to use when they covered his next step forward to Luzon.





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SCALE OF MILES

THE MEANING OF MILITARY UNIFORMS

By Mr. JAMES LAVER, C.B.E.

On Friday, 30th March, 1951, at 3 p.m.

BRIGADIER-GENERAL SIR ERNEST MAKINS, K.B.E., C.B., D.S.O., in the Chair

THE CHAIRMAN: I think that we may feel ourselves very honoured this afternoon by having such a distinguished lecturer as Mr. James Laver to talk to us about British uniforms. As you know, Mr. Laver is the Keeper of Prints and Drawings at the Victoria and Albert Museum. He has also extended his research into costumes in general and, as you will realise this afternoon, has paid special attention to military uniforms. You have probably read his little book which was published three years ago called *British Military Uniforms*, which makes it plain that he knows what he is talking about. Therefore, I will not keep him any longer from you and will ask him to give his address.

LECTURE

I FEEL that I am here this afternoon under some kind of false pretence or misapprehension. I am not an expert on military uniforms as such. Indeed, my only connection with the Army was a short period of service during the 1914-18 War. During the recent war, when my Museum was shut up, I had a very peculiar job. It was my business to go about the country and open all the Warships Weeks and War Weapons Weeks which nobody else would open! I did it 750 times! As you can imagine, my Chairmen were sometimes hard put to it to explain why I was there at all. They used to begin by regretting that I was not the King, Mr. Winston Churchill, or at least the First Lord of the Admiralty, and I remember one of my Chairmen, somewhere in the Provinces—the name of the town wild horses would not drag from me—who, after consulting his notes, said, "This is Mr. Laver. He had a very distinguished career in the 1914-18 War, rising to the rank of Second Lieutenant; since then he has been in a museum!" It is perfectly true, of course, but one would have wished it expressed rather differently.

I have been in the Victoria and Albert Museum for nearly 30 years, and my interest in clothes began for a purely utilitarian purpose—an attempt to date pictures. What used to happen was something like this. A lady would come to my students' room and say: "This is a miniature portrait of my great-great-aunt Augusta who danced at the Waterloo Ball." I would look at it and then say, "I am sorry, madam, but the young lady was about 20 years old then and she is wearing the dress of 1840, so wherever she was, she could not have been at the Waterloo Ball." Then the lady would say, "Well, is there anyone else I can see?" As time began to play its usual havoc with my face, hair, and figure, they began to take my word for it!

For that purely utilitarian purpose of dating pictures I began to assemble a file of fashion, for I found that I could date any picture to within two years in the XIXth Century, to within five years in the XVIIIth Century, and ten years in the XVIIth Century, with an increasing margin of error as I went back in time, on one condition, namely, that there was a fashionable woman in the picture! Men will not do, for reasons which we shall consider later, and peasants will not do, because the whole point of peasant costume is that it changes by place and not by time. That is the normal way for costume to change. In the Middle Ages, if you stayed where you were, nothing altered. If you went into the next village, everything was different. That was to be under the tyranny of place. To-day, if you go to the ends of the

earth, you still find the same deplorable soft felt hat! Stay where you are and the coiffures of the ladies are different every six months. That is to be under the tyranny of time.

I found it was quite possible, by assembling a file of fashion pictures, to use fashion as a kind of indication of the date of pictures, but once you attempt that and admit that you can date a picture by the costumes worn by the people in it, you let yourself in for a great many implications. You are up to your neck in philosophy, psychology, religion, and what have you.

The Modesty Theory

The human mind being what it is, I soon became discontented with dealing only with the "what" of fashion, and I began to meditate about the "why", and it is this meditating about the "why" which has got me into all the trouble. Why do we wear clothes anyway? That is the problem which presents itself to anyone who studies the subject. Of course, the first theory which we were taught in our early days, and which has been held by very many people throughout history, is what one might call the "modesty theory." We wear clothes in order to conceal our shame. In the words of Dr. Doddridge: "Why should the garments made to hide our parents' shame provoke our pride?" That modesty theory has now been discarded. Nobody saw that they were naked until people had been wearing clothes for a long time.

The next theory was that people took to wearing clothes to protect themselves against inclement weather, in particular against the cold. That is simply not true. Primitive man's obvious protection against weather was not a suit of clothes but a house. Even to-day the Eskimo strips naked when he goes into his igloo. Primitive people did not wear clothes to protect themselves from rain. Even at the present time, the Chinese boatman, when rain comes on, takes off all his clothes and puts them in a dry locker in the boat, works naked in the rain, and then, when the rain stops, puts on dry clothes. That is to do the thing sensibly, and obviously it knocks on the head any theory that we wear clothes to protect ourselves from the wet.

Protection against the sun is very doubtful, although that did lead to the invention of the umbrella. The rather large palm leaf held in the hand was the obvious ancestor of the modern umbrella and, incidentally, of all hats, because hats are either umbrellas, or crowns with a high degree of esoteric significance.

The Evil Eye

If we reject both of these theories, as I think we must, what remains? There is, of course, the magic theory which in anthropological circles, I believe, holds the field to-day. The most potent fear of primitive man is undoubtedly the evil eye, or some kind of magical ritual practised against him, and what he fears the evil eye will do is to smite him and his wife with sterility. That seems to be fairly firmly established. Therefore he hangs about his middle some kind of talisman which will ensure his fertility, and one of the most powerful talismans to the primitive mind is undoubtedly the cowrie shell, which is the symbol of fertility.

Therefore, we have three theories, two of which we have rejected and one which must be accepted in some form or other. There remains the decoration theory. Man soon began to discover that the wearing of clothes, in however primitive a form, gave rise to certain agreeable mental reactions. They enhanced his feeling of importance; they titivated his dawning æsthetic sense. From the first the successful were always able to adorn themselves and their wives more lavishly than the unsuccessful. The

germ of class distinction was already present. It came to be taken for granted that the chief was entitled to more decoration than the simple warrior, and in time this was crystallized into an unwritten law and then into a sign of rank. I call this the Hierarchical Principle, which makes it seem quite fitting that the red band round the hat of a general is out of place round the hat of a private!

The next principle is what I call the Seductive Principle, the attempt to make the wearer of clothes as attractive as possible to the opposite sex. It is, in general, the governing principle of female costume, but it is not without influence on the costume of males, particularly with regard to military uniform.

There is a third principle, which we may call the Utility Principle. Although its importance is often exaggerated, it cannot be ignored. It prevents a woman from wearing a crinoline 60 yards in circumference, but not from wearing one six yards in circumference. It prevents a man from wearing a coat in which it is impossible to breathe, but not from wearing a coat in which it is almost impossible to breathe.

Those three principles, in my opinion, explain the whole bag of tricks. They are true on any level experience. If you like to think in theological terms, the Hierarchical Principle is the world, the Seductive Principle is the flesh, and the Utility Principle is, of course, the Devil! If you have interests of a sociological or philosophical nature and you think that the Utility Principle is the only one which should rule, then you are a Marxist. If you think that the Seductive Principle is the only one which should have any influence, then you are Freudian. If you think that the Hierarchial Principle should prevail, then you are a Conservative!

The role of the Seductive Principle is reduced to small proportions in male dress, but is not entirely absent. On the purely physical side, men are admired for their height, breadth of shoulders, narrowness of hips and so on, but in general, especially in civilian clothes, this principle has very little to say in the matter.

The Utility Principle is never entirely absent. It began in a curious way by giving a man a pouch in which he could put things. It was obviously a great advance in the development of projectile weapons when you could have a spare stone in a pouch in your belt. Primitive and mediæval men had pouches, and it was a real revolution when some XVIIth Century genius invented the pocket. I have been faced with the question, "When was the first pocket?," and, as far as I can ascertain, it was put in a suit of Charles I which is in my own museum. However, it was called a pocket long before it was inserted in the garment itself.

How do male clothes in general work? Let us take the tailcoat, which we still occasionally wear in the evening. If we can see something of the history of that coat we shall, perhaps, understand how all male clothes evolve. What is the history of that coat?

Civilian Uniform

In the XVIIIth Century, civilian man had established a regular uniform. It was a beautiful uniform and the last of the aristocratic clothes—the uniform of the French courtier. The coat was embroidered at every seam, there were rather tight breeches, white silk stockings, buckled shoes, powdered hair, and the three-cornered hat. Everybody in Europe wore it—except the English country gentleman, who did not spend his time fluttering around Court, but on his country estates. He was compelled to invent a kind of sports costume. He found that when he rode to hounds the three-cornered hat was too wide in the brim and too low in the crown. It blew off and did not save his head when he fell on it, so he invented the first crash helmet and gave us

the top hat. He found also that the embroidered coat was too flimsy for his favourite pursuit, so he made a coat of plain cloth and cut a square slice out so that he could sit a horse. When we wear a coat which has a square slice cut out of it we are saying, " I am an English country gentleman and my only interest is riding to hounds ! "

What happened to that coat ? After the French Revolution, while the women went back to the ancient Greeks for their clothes, men only went back to the English country gentleman. Clothes after the French Revolution were simply country clothes worn in town. The rather dashing young men began to wear them in London. Of course they were cads ! After a time everybody began to wear them in town. I am sure you can recall to mind that picture on the famous advertisement of " Johnny Walker—born 1820—still going strong." It is very carefully drawn, and it shows the dress of a man about town in 1820. It is a version of the sports clothes of two generations ago.

What happened to it ? It became evening dress and went black in the process. Then it became servants' costume, because servants wear the discarded clothes of their masters. In the middle of the XIXth Century servants wore the discarded clothes of the XVIIIth Century, even to the powdered hair, and in the middle of the XXth Century they wear the discarded clothes of the XIXth Century, that is to say, they dress as waiters. The only way in which you can change man's clothes is to bring in a new sports dress, and then they all move up one ! My son, who is at Oxford, thinks that the normal wear for a young man is a sports coat and grey flannel bags, and so it is. In 20 years time I prophesy that, darkened and smartened, it will be ordinary wear, and a kind of battle-dress will be the new sports outfit. It works out that way over and over again, and I am only illustrating it because it is of great interest in connection with military uniforms.

The Objects of Uniform

It seems to me that the objects of military uniform are five-fold. It enhances the manly pride of the wearer ; it reinforces the feeling of solidarity and esprit de corps ; it establishes the Hierarchical rule ; it impresses and/or terrifies the enemy, and it protects the wearer without interfering with movement. These objects have obviously not always been manifested in the same degree. The most primitive of them is that of frightening the enemy, and that only survives in present times in the deaths-head badge of the Hussars.

It is probable that English troops were first clothed by the government in the reign of Edward III who, according to Rymer, raised 1,000 men in Wales, armed them with lances, and provided for each man a tunic and a mantle. In general, in mediæval times, there was no uniformity of dress, and very little in equipment and weapons. The second earliest uniform now extant is, of course, that of the Yeomen of the Guard, the oldest being the guards in the Vatican.

The Yeomen of the Guard, raised by Henry VII in 1485, may be considered the first formation of a Regular standing army in England. Half the force carried bows, half arquebuses, and all had long swords. In the reign of Henry VIII some of them were armed with halberds. They had originally a shirt of mail, but over this they wore a vest of red cloth, laced in front, with tight hose on their legs. Their costumes, as well as the halberds, they still retain.

Charles I took considerable pains to bring about uniformity in the armour of his troops, both officers and men, but still there was little or nothing which could properly

be called uniform. In paintings of the period, troops can be seen wearing helmets of the same pattern and carrying the same weapons, but their clothes, especially the breeches, show a variety of colours.

One of the difficulties of troops in those days was to distinguish friend from foe. This is brought vividly before us in a passage in the memoirs of Robert Cary, Earl of Monmouth, concerning the English campaigns in Flanders under the Earl of Essex. Describing a seige operation he remarks, " One night there were scaling ladders prepared .... We were all commanded to wear shirts above the armour .... and this was done accordingly." This may be regarded as an attempt to distinguish the English from their adversaries, in short—counter-camouflage. It was important that the attacking troops should be able to see one another in the darkness.

With regard to armour, James I once remarked, with a flash of pawky humour, that armour was an excellent invention, for it not only saved the life of the wearer, but prevented his hurting anybody else! This became increasingly evident as the XVIIth Century progressed. Armour began to shrink and, as it were, wither from the feet upwards. Even before the death of James, the armour of even the heaviest cavalry terminated at the knees, and by the end of the Century it had dwindled to the doubtfully useful breastplate and the purely vestigial gorget. Of course, I do not have to remind you that those striking pictures of Marlborough and other generals of the period in armour are fancy portraits and have no relation to the field of battle.

It is nice to know that film producers are beginning to take notice, so far as the correctness of military uniforms is concerned. My first experience of a film producer was some 25 years ago. I was sitting in my office when a very excited man rushed in and said, " Can you come out to —? " " Now? " I asked, and he said, " Yes, I have a car waiting." We rushed off to — and when we arrived in the studio I saw a lot of nondescript officers hanging about. The producer said to me, " Oh, you have come. There is one question I want to ask you and I want an answer, yes or no. Should the officers wear Sam Brownes or not? " I replied, " What nation are they supposed to represent? " He said, " That is of no consequence." I then asked what period it was, and he replied, " That does not matter." I looked at them for a moment and then said " No! " I was taken back by car and the next day I received a cheque for £20!

Maintenance of Esprit de Corps

There were several influences making for uniformity about the time of which I have been speaking. In addition to the obvious one already mentioned, i.e., the necessity of distinguishing friend from foe, there was the psychological reason which lay behind the whole idea of the " New Model." It was the great discovery of the XVIIth Century that the esprit de corps and fighting spirit of a body of troops could be vastly increased by drilling them together and clothing them in the same garb. Another purely utilitarian reason was that colonels found it more profitable to buy cloth for their troops in large quantities, and that such bulk orders were easier to execute if the colour was constant. But this only affected the coats; breeches continued to be any colour the wearer chose.

When Charles II came back in 1660, he much admired Cromwell's troops, though he had to disband them. However, having done so, he re-engaged nearly all of them and made them into his own army. I do not think that until modern times any more sensible or useful dress for soldiers has ever been devised than those worn

by Cromwell's troops. They wore loose baggy trousers, a coat of buffalo hide sufficiently tough to turn a sword thrust, and what was called a " pot," a steel helmet with a piece at the back and a bar in front to prevent sword slashes at the face.

By the end of the Century a great change had come about. No more absurd uniform has ever been devised than the uniform worn by Marlborough's officers. They left not only their hats but their periwigs on the battlefield, and one of the main sources of income for the peasants was to collect the wigs and sell them for £5 a time !

Military uniform and civilian dress were hardly yet distinguishable. Gerald Heard, in his book *Narcissus*, makes the interesting suggestion that much of the force of clothes which ought to have operated throughout the whole field from 1700 onwards went shut up in military uniform. It is true that both civil and military clothes diverge somewhere, but not for long. If you look at *The Clothing of the Forces in* 1740, you will see that the men are simply wearing the dress of the time. That is quite a sensible dress—a long coat, waistcoat, breeches, buttoned gaiters, and three-cornered hat.

The Mitre Head Dress

Incidentally, I should like some enlightenment as to the origin of the " mitre " head dress. I take it that it was impossible to throw a grenade in a three-cornered hat, so they started by giving grenadiers things like nightcaps. The strange thing is that fashion is like a plant ; it tends to ossify and get stiff, and you cannot give any troops a nightcap without finding that it stiffens itself and rises off the head ! That is the fascinating thing about fashions ; they behave as if they had a life of their own. That is, as I see it, the origin of the mitre hat in the XVIIIth Century which is obvious in the paintings of the period.

Coming to the end of the Century, you all know the kind of uniform worn by Wellington's troops. The strange thing is that when the British troops occupied Paris in 1814, they found they were rather dowdy in comparison with the French, Russians, Austrians, and so on. In general, a victorious nation tends to impose its fashion on the whole of the armies of the World. The American Civil War, for instance, was fought in French uniforms because at that time France was on the top of the wave. In 1814, so great was the prestige of Napoleon's troops, that we copied a great many of the details of their uniforms. The other thing which we copied was the dress of the Lancers.

Cavalry uniform is, to me, an extraordinary subject indeed, because all kinds of other elements enter into it. I see it like this. Whenever any war breaks out you find that you have no light cavalry. You find that what *was* your light cavalry has become heavy cavalry ; therefore, in order to obtain a light cavalry, you are compelled to enlist auxiliaries. In the XVIIIth Century you went Eastward in Europe to find countries which still had horsemen, and the first you found were the Hungarians. Louis XIV enlisted Hungarians to be his light cavalry, and since then Hussars have worn Hungarian uniforms. Then Napoleon engaged Polish horsemen in characteristic square caps to be his light cavalry, and all the Lancers for the rest of the Century wore Polish uniforms.

A similar thing happened in the Crimean War. Once more the old cry went up, " We have no light cavalry." A writer who served through the campaign complained that the " distinction between heavy and light dragoon is but a name." We were unable to follow up our success at the Alma owing to lack of light horse, and through-

out the campaign " we trusted mainly to the Bashi-Bazouks for the performance of outpost duties." Once more the duties of reconnaissance and pursuit fell to auxiliary foreign horsemen, a fact of the utmost importance in the development of cavalry uniforms.

CONCLUSIONS

Perhaps it would be best if I were to sum-up what my conclusions have been as regards military uniforms in general, and I may therefore attempt to tabulate them as follows :—

1. Military uniforms are the appurtenances of Kings' Body Guards and the professional armies which developed from them. Their history is, therefore, very short—little more than 200 years.

2. They are founded on contemporary civilian dress, somewhat modified in the direction of toughness by the " Utility Principle " and nearly always modified in the direction of gorgeousness by the " Seductive Principle."

3. Once established, they seem to develop a life of their own, exaggerating all their characteristics to a degree of fantasy not known in male civilian dress since the time of Charles II, which is precisely the period when uniforms began to develop.

4. Every war tends to drag uniforms back to the Utility Principle, expressing itself in looseness (for ease in battle) and in camouflage. Modifications, therefore, are likely to be first seen in the dress of light infantry and auxiliary troops generally, and those engaged in Colonial warfare.

5. Every army engaged in actual fighting is compelled, sooner or later, to develop its own " battle-dress." The uniform which it has discarded then becomes " walking out " dress, i.e., a smartened version of the battle-dress of the previous war.

6. Ceremonial uniform is often the battle-dress (formalised and fantasticated) of the last war but one. In the days of huge conscript armies this is only retained by the Household Troops, i.e., the King's Body Guard.

7. The general colour of national uniforms (red for Britain, white for Austria, etc.) seems to be determined by accidents of history, That soldiers ever wore red because " it did not show blood " (it does show it very clearly as a black stain) is a vulgar error. Once the Utility Principle has triumphed the colour of all uniforms is an attempt at camouflage.

8. Military fashions are extremely imitative. The dress of any successful troops will be copied, especially in unessentials, and any victorious nation tends to impose some detail of its uniform on the armies of the World.

9. Military headgear has two purposes—to protect the soldier's head and to increase his apparent height. The second purpose ruled almost exclusively from the abandonment of the Cromwellian " pot " to the 1914-18 War. The protection of the head (i.e. the Utility Principle) has now triumphed completely, and the only consideration about the soldier's hat is how quickly it can be stowed away.

10. Cavalry uniforms follow certain peculiar lines of their own. They strive always for gorgeousness and display and frequently develop decorations which make it impossible for their wearers to function as cavalry.

11. All cavalry tended to become heavy cavalry, and as light cavalry was always needed in war, recourse was had to the services of auxiliaries. These have in the past generally come from the less settled lands of Eastern Europe, and as their skill

on horseback is admired, their uniforms are copied, first slavishly and then with increasing fantastication.

12. Mounted troops other than cavalry (e.g. horse artillery) tend to adopt cavalry uniforms, with a marked preference for that of the Hussar.

13. Modern uniforms are vestigial in two senses of the term. They have become on the one hand a parade, or walking-out, dress, and on the other have shrunk to mere insignia of rank or to miniature badges of territorial or regimental loyalty—a button and a pip. Before an actual assault even these are discarded. In modern warfare, therefore, the Utility Principle has triumphed completely, and the dress of Commandos and tank crews is no more a uniform in the proper sense of the term than are the dungarees of the factory hand.

14. It is probable, however, that uniforms will continue to exist, paradoxically, as the costume of a soldier when he is not fighting.

DISCUSSION

In the subsequent discussion a speaker referred to the deathshead mask and ribs of the Hussar's uniform and suggested that the modern ribs were simply a fantastication of the original Hungarian jacket, fastened with buckles and pieces of string. The mask was worn by three or four regiments of the Prussian Army. There was also the suggestion that when Frederick the Great ordered his light cavalry to wear a head-dress similar to that worn by the Hungarians, the hat maker discovered in the sample given to him a piece of cardboard with a skull on it. The reason was not known, but Frederick the Great then said: "My troops shall wear the skull outside."

With regard to the word "Hussar," another speaker pointed out that from the VIIIth Century to about the XIIIth Century, there were a group of tribes called "Khazars" by the Russians. They wore the Mongolian national costume, and it might be that the word Hussar had its origin in the name of those tribes. It was suggested that the word was "Kuzza"—a Turkish word—from which the word "Cossack" was derived.

Referring to the "mitre" cap, a speaker stated that there was a reference in John Evelyn's diary to the original grenadiers in the reign of Charles II, and it would be interesting to know whether Mr. Laver could recall an illustration of the mitre cap before that time. Mr. Laver, in reply, said that if the theory were sound, he would suggest that in the last 20 years of the XVIIth Century, grenades were thrown by soldiers wearing what he called the "night-cap," and in the first 20 years of the XVIIIth Century, that night-cap stiffened itself into the mitre cap.

Asked whether the decoration of the modern pyjama had any connection with the braiding of the Hussar's uniform, Mr. Laver replied affirmatively, saying that the pyjama was an act of romanticism, anyway!

On the assumption (which appeared to be borne out) that dress uniforms were more or less glorified battle uniforms of the preceding campaign, a speaker asked whether Mr. Laver had any idea what kind of dress uniform would be derived from the modern battle-dress.

Mr. Laver replied that, in times of peace, the regimental serjeant-major and the military tailor got together in an endeavour to smarten the troops. That invariably took the form of tightening up uniforms so that when the next war broke out, the troops could not fight in them!

Another speaker said it was interesting to note that after the last war, the Household Troops immediately went into a ceremonial full dress which was, in fact, the 1914/18 Service dress with a few additions. Mr. Laver observed that that rather bore out his own view, but it was found that the necessity for a fine walking-out dress was rather knocked on the head by conscription. It was a smart uniform which got recruits.

Replying to a point concerning blue patrols, Mr. Laver said he was very disappointed at the Coronation to see what appeared to be a troop of policemen marching along. There should be no half-hearted attempt with ceremonial uniform. If ceremonial dress were adopted, it should be done properly.

Referring to the Seduction Principle, a speaker observed that in the case of nearly every war, the British suddenly became self-conscious about it and began to stifle it. For instance, at the end of the Crimean War any seductive quality seemed completely to have disappeared from the British Army. A similar thing happened in the 1914/18 War, and in the 1939/45 War. In every case it would appear that the Seduction Principle disappeared with the British, and it seemed to be due to a self-conscious feeling of looking a bit picturesque.

Mr. Laver, in reply, said that when the Duke of Wellington's troops fought their way to Waterloo, they were wearing battle-dress, but when they arrived in Paris in 1814, to take up garrison duty, they found that they were rather dowdy. George IV was impressed by the French uniforms he saw and he smartened up the British troops.

With reference to the " mitre " cap, a speaker recounted that while he was in Austria recently he saw a plate in a book which gave the whole history of the " night-cap " and the mitre cap. Unfortunately he was unable to give the reference. As regards the future, he recalled that the Americans took up battle-dress before the end of the War, and by the beginning of 1945, his Second-in-Command, who was an American, was already finding it very difficult to get into his battle-dress without the help of a friend, let alone get out of it !

Mr. Laver observed that, in answer to the old question of " Who won the war ? ", Britain certainly won the 1914–18 War insofar as the armies of the World imitated the British uniform.

A speaker recalled that he passed the remark on one occasion that it was not a case of who won the War but rather a case of who did not lose it, and he nearly got court-martialled ! He was, therefore, glad to hear who *did* actually win it !

THE CHAIRMAN : I should like to express our thanks to Mr. Laver for having come here this afternoon and for having given us such an interesting and entertaining address. It is a most interesting and intriguing subject to many of us, and whether we shall ever see the gorgeous uniforms again, I do not know. I was at my regimental tailors the other day and I understood from them that no gold lace is ever to be made again, and certainly not gold lace as we knew it. At the same time I had some old helmets I wanted put in order, but I was informed that there was no man who could touch a helmet to-day. Recently, I have also noticed that bears are getting rather scarce, and that may affect some of the King's troops rather seriously. However, perhaps it is just as well that some of the gawdy uniforms are not coming back. A young subaltern in a cavalry regiment in the old days certainly had to put his hand in his pocket.

Some of us have gone into the question of uniforms, but rather in a smaller way, and to-day we have had it put before us from the word go in a way that I have not heard it put before, and I am sure we are all very grateful to Mr. Laver, to whom I should like to propose a hearty vote of thanks. (*Applause.*)

This lecture was given under the auspices of The Society for Army Historical Research and, by their permission, is published in the JOURNAL. *Membership of the Society is open to all who are interested in historical research, and includes a quarterly Journal containing authoritative articles, illustrations, and a correspondence section. The address of the Hon. Secretary of the Society is :—c/o The War Office, Whitehall, London, S.W.1.*

PAX ATLANTICA

By J. M. Spaight, C.B., C.B.E.

A TREMENDOUS event is happening in our day, but we are too close to it to grasp its significance. The United States is arming, arming feverishly, massively, on a stupendous scale. She is making herself, with her immense war potential behind the armaments, by far the most formidable military Power in the World, and she is doing it all for the purpose not of waging but of averting a great war.

There have been precedents in other lands for what she is doing, but they were created by States bent upon aggression and conquest. The United States has no such designs. Her aim is very different and she does not want war. Why on earth should she ? She would be stark, staring mad if she did. There is no future in it in her philosophy.

The reason why she is girding on her armour is, of course, the threat to herself and other free nations implicit in the immense armaments and the expansionist policy of the Soviet Union. It is Russia who has provoked the United States to do what she has never done before, to turn herself into a great military Power, armed to the teeth, before a shooting war has begun. There is little for which we have to thank Russia in these days, but for one thing we should be grateful to her, namely for prompting a movement in the United States which may have a great and lasting effect upon the peace of the World. We have to thank in a lesser degree those two apt pupils of hers, the North Korean and Chinese Communist Governments. But for the amazing follies of all three, the United States might have reverted before this to her historic isolationism.

Russia and the West

Whether the international cauldron will boil over into a third world war or not is a question which no one can as yet answer with assurance. The East may have to be thrown back in a great battle, as it was by Charles Martel and his Franks in 732 ; or it may concede the verdict without any actual fighting. Good chess players can recognize defeat long before the final moves in the game, and the Russians are good at chess. One cannot foresee what will happen. One thing, however, is fairly certain ; it is that the present situation cannot last for ever. At some time or other the Cold War will be succeeded either by a red-hot war or by the realization of the men of the Kremlin that the free nations have become too powerful to be attacked with any prospect of success. Before that breaking point, for good or ill, is reached, there is a possibility, and after it is reached a probability, that Russia will reduce her contacts with the West and abandon the attempt to mould the free nations to her own heart's desire.

No one will regret her decision, if and when she takes it. The free nations are heartily sick of her and her vagaries, her obstructiveness, her reiterated negatives, her impossible manners. She has lowered the whole tone of diplomatic discussion. Since 1945, Europe has been like a village cursed by the presence of a shrewish woman who takes delight in poking her nose into everyone's affairs and making herself unpleasant to all her neighbours : an ill-natured, cantankerous, spiteful gossip of a woman, happy only when she can upset other people and set them by the ears. They are, most of them, decent people who observe the conventions and only want to live in peace and amity with all, and they could do so if it were not for that one

trouble-maker. As it is, they have to listen to an endless stream of raucous abuse, false witness, poisonous insinuation. The right prescription for such a virago would be the ducking chair and the village pond, but the neighbours are respectable folk who do not descend to that sort of thing. They just put up with her, hoping she will mend her ways. They take the precaution, all the same, of making arrangements for mutual assistance if she should go quite off the rails and assault any of them. This sensible precaution is denounced, of course, as an added grievance, as war-mongering. There is no living with such a person.

Russia and the East

Russia may see in the end that the course of behaviour which she has been pursuing does not pay. One devoutly hopes that she will be taught wisdom without open war. What happened before may happen again. She may decide to pull in her horns, to retire into her vast hinterland, and to leave the rest of the World at peace. One reason for which she may do so is that there would be less risk then of her Marxist citizens being corrupted by contact with the less enlightened, capitalist peoples. She has no earthly need to go out looking for new domains to conquer. It would be better for herself and others if she were content to cultivate her own big garden. Her hands will be full doing just that.

If she does withdraw from the West and her unprofitable adventure there, she will be returning to a policy which some of her own prophets have advocated. Lenin said: "Let us turn towards Asia." Prince Trubetskoy advised his countrymen: "Do not look upon yourselves as sons of Europe; she is not your mother. . . . The path is clearly marked out towards the East. Russia has been wrong in failing to recognise her oriental character and to allow herself to be enticed by western illusions."[1] The Western World will heave a great sigh of relief when again the Russians hearken to such counsels. Russia is not really European at bottom.

Whether the result will be as happy in the East is doubtful. That area may become the storm centre; there have been some small storms there as it is. More serious developments there may have a repercussion upon the global situation. For the United States, the Pacific is an ocean not less dangerously brimming with currents of unrest than is the Atlantic. She cannot forget for a moment the second of the two great seas which lap her shores. The problem presented to her in what is, to her, the West is different from that with which she has to deal on the Atlantic side, but is not less difficult to solve.

An Abnormal Situation

The circumstances in Europe have, for the United States, been special and abnormal since 1945. American troops have been in military occupation of a zone of Germany and a sector of Berlin. They have been in uncomfortably close juxtaposition to Soviet troops. There has always been the possibility that, by reason of their presence, the United States might become involved in hostilities in Europe, and the North Atlantic Treaty has amounted, therefore, to little more than an affirmation of a commitment imposed by the facts of the situation.

That commitment has not gone unchallenged in the United States. Some of the political leaders in that country have been opposed to the sending of American troops to Germany to an extent not warranted by the needs of the occupation.

[1] Quoted by Professor Georges Jarré, *The Soviet Union : The Land and its People*. English translation, 1950, p. 335.

Mr. Hoover, the ex-President, has been one of them. He has urged that America's contribution to the maintenance of peace should be limited to the furnishing of assistance at sea and in the air to nations that might become victims of aggression. A somewhat similar attitude to the question, as it affects the Far East, was taken up by Mr. John Foster Dulles when he visited Japan in February, 1951. He was reported to have advised the Japanese people not to count on the continuing presence of large American ground forces, and urged them to rely for protection from aggression on the air and sea power of the United States and on the deterrent influence of retaliation.[2]

A Swing towards Isolation

Much more will be heard of such counsels when the danger of Soviet aggression in Europe has lessened. That danger is the cement which binds the Atlantic Powers together. When it is loosened there is a possibility that the interest of the United States in the affairs of the older hemisphere may abate. The maintenance of a large standing army is contrary to the traditions of the United States, as it is also, indeed, to those of Britain and the Commonwealth. Furthermore, it is wholly unlikely that the American people will endorse the policy of keeping armies in foreign countries indefinitely. Enough of the old isolationism will survive to make such a policy simply not practical politics. The danger is that the swing may carry American opinion too far and that the place of the United States in the structure of world peace, a place that could not be taken by any other country, may be shaken.

It is the most important thing in the World that, after the existing tension has eased, neither the United States nor Britain should disarm to an extent that would weaken their influence for good in international relations. The practical question is, for each nation, how the armed strength that is necessary can be made palatable to a public opinion critical of a policy that was clearly necessary so long as tension was high, but may no longer seem to be justified when it has eased. There is bound to be a reaction of this kind and there may even be a reversion to the sloppy sentimentalism, the belief in disarmament as a panacea, which marked the inter-war period.

Nothing more foolish could be imagined than the behaviour of the victorious Allies then. Mr. Walter Lippmann has spoken of " that extraordinary [illegible]ement by which the partners of one great war disarmed one another in the s[illegible] period which remained before they were to be partners again in an even greater one." Governments and peoples had disarmament on the brain. The loss of perspective and balance was almost incredible.

One of the most amazing examples of the obsession was to be seen in the proposal which the British Government submitted to the Disarmament Conference at Geneva in 1932. The origin of it was that, under Article 198 of the Treaty of Versailles, Germany was forbidden to have an air force. She insisted on having an air force. She would be content with nothing less than parity with the other nations in this respect. In face of that, the suggestion of the British Government was that there should be parity at zero. So it was solemnly proposed that all air forces should be abolished, subject only to the proviso that some means should be found of dealing with the supposed menace of civil aviation. The proposal came to nothing because Germany, for other reasons, walked out of the Disarmament Conference in October, 1933. If it had materialized, Germany might well have won the 1939–45 War with her great army and her U-boats.

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[2] *The Times*, 13th March, 1951.

The Credulous Thirties

In the pre-war decade there was a great deal of muddled thinking on the subject of national defence. Some of the then leaders of public opinion declared that to rely on it for security was sheer lunacy. There could be no safety for a country under such a system, they argued, unless it were more powerful than its neighbour, in which case the neighbour would not be safe. Clearly, they continued, the people who put their trust in individual defence were not much better than half-wits, and the system of self-defence upon which they relied defied arithmetic and logic alike.

The basic fallacy in the reasoning of the critics of national armaments was that, in point of fact, there could be a world of difference between the uses to which countries might put their armaments. The one might be dangerous in the extreme, the other not dangerous at all. That difference was ignored in the arguments put forward by the critics, who considered that all armaments were bad, irrespective of who held them. To try and make good one's own defences when a restless, ambitious neighbour was re-arming feverishly, was to be provocative, to prove oneself a warmonger. When, two years after Hitler had come to power, a very modest, indeed entirely inadequate, increase was proposed in our Air Estimates—making the total for 1935–36 only £23,851,000—an M.P. denounced the proposal in the House of Commons in these terms :—

> To-night we have seen that the position in Germany, owing to the rise of Hitlerism and the development of her armaments, is being used to give our warmongers and the armament people in this Country an excuse for the further development of armaments here.[3]

Those who condemned reliance upon national armaments were usually, but not always, for some were dyed-in-the-wool pacifists, inclined to commend the system of collective security as a preferable alternative. That was sound enough in principle, but the difficulty was that such a system could not work unless the States concerned maintained their armaments on a scale sufficient in combination to check an aggressor, and unless, furthermore, they actually honoured the pledge to use those armaments when the call came. In practice they did not maintain adequate military establishments. Each State was disposed to shift the burden to the others' shoulders and to hope that if all did their duty its own contribution to the pooled defence might be hardly more than a token one. Naturally, " what was everybody's business was nobody's business," and even if the commitments entered into had been scrupulously observed, the armaments of the peace-desiring States would not have been of adequate strength to check a powerful and determined aggressor. The latter, because he was the aggressor, would have taken good care to see that *his* armaments were ample for his purpose.

To suppose that nothing of the kind will happen again after our experience in 1939 is to discount the Bourbonism ineradicable from human nature. Any sort of folly is especially possible when people, who have been living in a state of emotional tension for years, are suddenly relieved of the strain. They are apt to think that the golden age has come and that wars will be no more. The optimists who thus view the future with the eye of faith can count upon the support of the pessimists who think the Country has been brought to the verge of bankruptcy without very much reason. Economy becomes the order of the day after an orgy of spending on defence which may seem in the end to have been unnecessary because war never came after

[3] Mr. W. G. Cove, 19th March, 1935, *Hansard*, Volume 299, column 1,088.

all, but was by no means so if it had the effect of preventing war. We shall hear plenty of arguments, misguided arguments, in favour of our scrapping our inflated military establishments and saving the cost of upkeep of them. It would be nothing short of a calamity if, after the threat of a Russian aggression has become less probable, the Americans and we were to cut our Service estimates to the bone, as we did between the two World Wars.

The Changed Situation

They and we stand for peace. They and we must be strong. They and we must not be ashamed to be strong. We must not be afraid of being called Jingos, warmongers, what-not, in this great cause. We must lead the van. But neither they nor we will be prepared to go knight-erranting round the World if it means that either nation will have to bear permanently a burden such as neither has ever had to bear in time of peace in the past. The forces of all arms which each of the two countries is raising at present are appropriate to the needs of the time. They will not be appropriate to those of a World which is not bedevilled to the same extent by militant Marxism. There will be, one may expect, a disposition to challenge the necessity for the maintenance of armaments greater than, and different in character from, those which Britain and the United States have maintained in the past.

The Two Oceanic Powers

In the past the two countries, and especially Britain, have relied primarily upon their naval strength. They have been oceanic Powers. More than 50 years ago the American naval historian, Rear-Admiral A. T. Mahan, pointed out that, alone of the great Powers, Britain and the United States " are so severed geographically from all existing rivals as to be exempt from the burden of great land armies. . . . To Great Britain and the United States, if they rightly estimate the part they may play in the great drama of human progress, is entrusted a maritime interest, in the broadest sense of the word, which demands, as one of the conditions of its exercise and safety, the organized force adequate to control the general course of events at sea."[4]

Were Admiral Mahan living to-day he would have bracketed, one thinks, with the maritime trust confided to his country and ours, a mission in the air as well. Air power and sea power are linked inseparably in the chain of defence of the ocean routes of the World. It would be fitting, and would probably be more acceptable to general opinion in Britain and America, if their contribution to the maintenance of peace took the form of sea and air forces of a suitable magnitude rather than of large land forces maintained in time of peace. Conceivably, France might be joined with them in this respect, but her proper role in any plan of collective security would seem rather to lie in the sphere of land warfare. It is there that she has traditionally been in the van of Christendom. The other countries of the Atlantic Pact, except Canada, whose place would be alongside that of Britain and the United States, would similarly be assigned to their appropriate posts in the domain of ground defence. They, with France at their head, will have to man the battlements of western civilization.

The Sea and the Air

The kind of division of labour outlined above would fit not inaptly into the framework of security provided by the Charter of the United Nations. The Charter

[4] Rear-Admiral A. T. Mahan, *The Interests of America in Sea Power*, 1898, pp. 110–11.

assigns to the air weapon a place of particular prominence in the armoury of collective security; under Article 45 air contingents are to be held in special readiness for employment on behalf of the United Nations. It has always seemed to the present writer that mention should have been made of aircraft carriers in the same connection. The employment of them for a like purpose would fall within the spirit of the provision even as it stands. Britain and the United States, with their world-wide responsibilities, would be in the best position to make available at short notice the aircraft and carriers for whose presence at critical points the Security Council might call. In aircraft carriers, mostly American, they have an overwhelming superiority over all other countries combined. Their advantage is no less pronounced in other surface warships. They have the use of shore bases from which their strategic aircraft could reach all the probable storm centres in Europe, the Middle East, and the Far East. They could send powerful flotillas on the sea and in the air to carry into any troubled regions the signs and symbols of international law and order. Those flotillas might never have to be used in action. Their mere presence should normally suffice to safeguard the peace of the World. The knowledge that the master hands of sea and air power were ready to back the writ of the United Nations should be enough to give trouble-makers pause. Atlantic sea and air strength would perform the function which British sea strength performed in the XIXth Century, that of showing the flag in all the seven seas.

That was the era of the Pax Britannica. The new era may be that of the Pax Atlantica. Already the States bordering the Atlantic, on both sides of it, exert a predominant influence on the counsels of the United Nations. As and when Russia ceases to concern herself so unpleasantly with the affairs of the Western World, that influence will increase. The Atlantic nations will be the leaders in the great march to peace, not only in the ocean by whose name they are called, but all round the globe. It will not be, for years to come, an age of unclouded and untroubled peace, but it should be at least one stage nearer to that goal of all men's desire.

ARMY IN AFRICA

By Brigadier F. A. S. Clarke, D.S.O.

JUDGING from recent ministerial statements and reports in the Press, it has at last been decided to expand our African forces. It is unfortunate that this step was not taken three or four years ago when expansion would have been easier, and before the scene had become darkened by political developments which may affect the project in some of the Colonies.

The purpose of this article is to indicate the role which might be allotted to our African forces, and to make comments and suggestions which may be of interest to officers who have not served with African troops. A good nucleus is available in the existing regiments but in order to ensure efficiency and to avoid setbacks, it is essential that the expansion, organization, and particularly the selection of personnel, be based on experience and not on wishful thinking or political expediency.

For years the formation of an " Army in Africa " was a vision on the part of many officers who served with the Royal West African Frontier Force or King's African Rifles. But, although tentative proposals were made before 1939, the idea never met with encouragement at higher levels, and hasty expansion had to be undertaken during the last war. In West Africa this did not start until July, 1940, and, fortunately, there was no interference by the Vichy French. The success achieved was mainly due to the fact that the task was carried out by a commander and staff with the requisite experience, aided by cadres of Regular officers and n.c.os. with previous service in West African units. Nevertheless, some mistakes did occur in the hurried expansion, one of which was the enlistment of some unsuitable types. It must also be remembered that many thousands of labourers were recruited who, during the War and since, have given a wrong impression of the African soldier.

Since the last war, however, solitary voices have been raised from time to time in Parliament urging greater use of our African manpower, though, up to now, with no result but evasive answers. The main reasons, apart from the usual *laissez-faire* in matters of defence, may have been the cost and difficulty in agreeing on the financial contributions to be made by the Colonies, and the fear that their economic development would be impeded. The only other obstacle seems to have been the attitude of the Union Government to the employment of African troops. However, the " red " and/or " yellow " peril may now have superseded the more nebulous " black menace " in their minds.

As the changing world situation has increased the strategic and economic importance of Africa, adequate preparations for its defence by the Western Allies are essential. It must be understood, however, that tropical Africa, especially West Africa, is unsuitable for operations by European units and formations, even if such were available. There is no doubt that Africa cannot be defended unless strong and efficient forces of African troops are in being when the emergency arises.

Employment of African Troops

The primary role of the expanded forces must be the defence of our interests and possessions in tropical Africa. The fate of Africa, however, may not be decided on her own doorstep, so it would be folly to agree to confining the service of African troops to that continent. Under existing conditions there is always the possibility of our having to undertake operations in bush or jungle country in various parts of the Empire and its confines, particularly in South East Asia. Bearing in mind the

lessons of the fall of Malaya it is clear that we should maintain a striking force, highly trained and conditioned to bush warfare, ready to move at short notice. We have no British units available for this purpose, and bush warfare cannot be taught on Salisbury Plain.

We can no longer call on the four Regular Indian divisions, formerly available quickly in an emergency. There is a shortage of British manpower for our general needs; fewer Regular units exist than in 1939; and, the responsibilities of the Regular Army have increased. It would seem reasonable, therefore, that we should aim at using African troops wherever possible to relieve British units in small tropical garrisons and so free them for service elsewhere.[1] It must be realized, however, that African troops are definitely unsuitable for either operations or garrison duty in Europe, in fact, in any cold climate.

The possible employment of the African forces may be summarized as follows :—

(*a*) Defence of our African possessions.

(*b*) Provision of expeditionary or striking forces for operations in the tropics.

(*c*) Relief of British units in certain small tropical garrisons in peace and war.

The first requirement involves the provision of balanced mobile forces of all arms for the local defence and internal security of the Colonies. Static troops for the defended ports, including coast-defence and anti-aircraft artillery, will also be necessary. The units and formations earmarked to form expeditionary forces would, in some cases, supplement the local defence troops by providing a striking force in Africa, in others they would furnish a contingent for service outside Africa.

Nevertheless, sufficient trained and mobile units ought always to be retained in the Colonies to provide for their local defence in any circumstances likely to arise. In July, 1940, the West African Colonies, having sent the bulk of their Regular troops to East Africa, were each suddenly threatened on three sides from French territory in the hands of a hostile government, with considerable ground and air forces under its control. Such a situation must not be allowed to recur.

Units for garrison duty outside Africa, mentioned in (*c*) above, would have to be additional to those forming part of the striking forces. The units employed should change stations with the others in Africa after two or three years; there is a risk of deterioration if they are allowed to vegetate.

It may be argued that the above proposals contemplate far more than can be achieved under existing conditions. They are, however, no less than our requirements warrant, and are surely not too visionary to be regarded as an objective. Difficulties, political or otherwise, must be overcome now as they have been in the past; and, it is time we dropped our apologetic attitude.

Long or Short Service

The terms of service require thorough consideration. Long colour-service produces the better soldier; short colour-service is not popular with the African, nor is it suitable. The African recruit learns his trade slowly and tends to become rusty or deteriorate when he leaves the Colours unless employed in the Police or some similar occupation under European supervision. Moreover, those who return to distant villages may not hear the order recalling them for weeks, and then their

[1] See "Economy of Manpower in the Services," R.U.S.I. Journal, August, 1947.

journey to rejoin may take a long time. It is, therefore, unwise to rely on reservists for quick mobilization.

The French have employed West African units for nearly a hundred years. After the 1914-1918 War they seriously considered the maintenance of very large numbers of these troops and, in practice, did use them in Europe. But, though haunted by falling manpower, they never formed a mass African army.

The desirability of our attempting to raise a large short-service conscript army of Africans is extremely doubtful for the following main reasons :—

(*a*) Unreadiness and low military value of such a force.

(*b*) Difficulty of finding sufficient British and African cadres for a mass army.

(*c*) Expense.

(*d*) Mobilization would be slow, and a complete gamble.

It is reasonable to suppose, therefore, that a mass army is neither expedient nor, indeed, possible. The alternative is dependence on long-service volunteers of whom a fair proportion should be allowed to serve twenty years for pension. The necessity for recruiting the right material and, ultimately, finance will limit the size of such an army in peace. But this method would produce an army which, though small, could be highly trained, well-disciplined and thoroughly reliable in the role which has been outlined above.

Training and Organization

Formerly we made a speciality of studying mountain warfare as applied to the North West Frontier of India and many Indian units were acknowledged experts in its theory and practice. Our African forces should be the recognized experts for operations in bush as, apart from other possibilities, efficiency in this respect is essential for the defence and internal security of the African Colonies.

There is no black magic or *juju* about bush warfare ; no strange principles are involved. It is war in a peculiar terrain which demands the commonsense application of suitable methods to the circumstances and conditions. Bush is a type of ground which must be given due weight in making plans, just as must be done anywhere else. But thorough training and ability to move freely in bush are essential ; untrained troops are at a hopeless disadvantage once off the roads. Bush favours those most able to take advantage of its characteristics ; the jungle is *never* neutral.

Experience shows that the best results are obtained if African recruits are first made into well-drilled and disciplined soldiers, thoroughly grounded in basic training and in the use of weapons. This applies not only to the Infantry, but to the other arms as well. Though collective training must include constant practice under varying conditions in different types of bush, the methods applicable to more open ground ought not to be neglected.

The bush training of officers is extremely important. " Officers must have a good knowledge of the country, the language and the use of the compass. They should be encouraged to photograph or shoot big game, for by so doing they gain a knowledge of conditions in the bush not attained in any other way."[2] The foregoing, which first appeared a good many years ago, is applicable to-day. Much useful experience can be gained by company marches in undeveloped country for which all arrangements should be made by the company officers. The exercise should last at

[2] " Notes on Training in Bush Warfare," Colonial Office, 1938.

least a week, the unit moving by bush paths; and, it should finish with a tactical exercise against a live enemy provided by another company.

A point which should not be overlooked is that a formation organized for bush warfare requires a higher proportion of Infantry than is usual. More eyes and ears are needed on the ground on a given frontage; all-round protection has to be provided; and detachments have to be made to escort transport—vehicles, pack animals or porters, particularly the latter.

One of our weaknesses in the Malayan campaign arose from the complete mechanization of the divisions employed. Not only did the mass of transport tend to block the road, but the units themselves were road-bound because even their first line transport could not leave the road or, at least, move any distance from it. The same thing has happened to the American formations in Korea. As a result of thorough training, units can move freely in bush but their mobility is limited without transport. The organization, therefore, must provide some means of supplying units and formations when they are required to move by bush paths. This may consist of pack animals or carriers (porters) according to local conditions. Even when air supply is possible, units will need first line transport. A man cannot march and fight in bush if weighed down with kit like a Christmas tree.

Finally, we should aim at simplicity in training and administration. Elaborate headquarters are out of place in African conditions, and inflated staffs only make unnecessary paper work.

Personnel

In Africa, as in other parts of the World, some tribes and classes are useless as soldiers. Care must be taken, therefore, to select the right human material. The Infantry and other combatant arms must be composed of men of fighting stock, preferably from the open bush, though in the ancillary services other types can be taken. The bushman may be illiterate but he can learn and, moreover, if coming of fighting stock, possesses the right background and necessary characteristics. This may, under existing conditions, become rather a vexed question, but it should be quite clear that in these days we cannot afford to make mistakes in this respect, and waste time, effort and money by raising forces of little or no value. The result of enlisting certain types for political reasons was shown in 1942, when such units raised in Burma proved to be ineffectual, whilst those recruited from the recognized fighting hill-tribes of the Country did very well indeed throughout the War.

There is no doubt that the fighting efficiency of African troops depends on the personality and military knowledge of their British cadres. Officers for service with these troops should be specially selected, preferably from volunteers, whose terms of service should be made attractive, as was the case prior to 1939. Local commanders, however, should, as in the past, be given authority to return forthwith anyone who proves unsuitable. Another point is that everything possible should be done to keep up the prestige of the officers; commanding officers should have much wider powers than at home. This was the practice in the past; it saves courts-martial, and is understood by the African of fighting stock who respects authority. It may be recalled that one of the reasons for the deterioration of discipline in the Bengal Army in the decade before the Mutiny of 1857, was the reduction of the status and powers of the unit commanders.

It was often suggested in the years before the last war that our African units should have a permanent British cadre as in the old Indian Army. This has the

advantage that the officers have long contact with and gain an extensive knowledge of the troops, their language and the Country. There are, on the other hand, disadvantages. Long service in a tropical climate, especially that of West Africa, is likely to produce a cumulative deterioration, and even those who escape this usually tend to become stale and parochial. There is also the possibility that the best types would not be attracted by permanent service in Africa for these reasons and fear that such service would be detrimental to their professional prospects. On the whole, the old system of tours with intervals of soldiering at home would appear the better solution, officers being seconded from their regiments as heretofore, and commanding officers being selected from those with adequate experience of the type of African and unit they are to command.

The writer remembers hearing before the last war that the Army Council was opposed to the permanent cadre idea for an additional reason. The benefit of experience gained under African conditions and the self-reliance resulting from the acceptance of much responsibility, even by quite junior officers, was considered to be of such value to the Service that as many as possible should have the opportunity to profit thereby. Certainly an appreciable number of distinguished general officers, serving and retired, have soldiered with African troops, including a Marshal of the Royal Air Force and an Army Group Commander in the last war.

The old long-service African was a very smart, keen soldier, proud of the Army, and devoted to his officers. In the writer's experience most of those who served with these troops became very attached to them and left with regret. If composed of the right material and given leaders of the right quality, African units, employed under conditions which suit them, can still be expected to give a good account of themselves, as they have done in the past fifty years. The African units have fine traditions which should be fostered in every way. Whatever reorganization is necessary the Infantry and light batteries should retain their old titles and distinctions in dress. Also ceremonial parades, so dear to the African soldier, should never be crowded out of the annual programme on the plea of lack of time.

Conclusion

In addition to their strategic and economic importance our tropical African Colonies are a reservoir of manpower, much of it of good fighting material. In considering the problem of their defence in a future war we have to take into account our heavy commitments elsewhere, the shortage of British manpower for our manifold needs, and the unsuitability of the climate for European formations. Expansion of the African forces would be a partial solution of our manpower problem; had we taken this step earlier we should now be in a stronger position and not so woefully short of efficient units at this critical time. Is there any doubt that bush-bred and well-trained African soldiers would be better in Malaya to-day than 18-year-old conscripts with three or four months' basic training?

Presumably the fact that first-class African troops are essential for the defence of Africa has been grasped by our ruling politicians. It has been suggested in this paper that the African Colonies should also make a contribution to the defence of the Empire as a whole which, as has already been indicated, they can well do. It is desired, however, to emphasize the fact that the best results will only be obtained with African troops when they are employed under conditions suited to their constitutions and characteristics.

An attempt has also been made to invite consideration of factors affecting the build-up, training and organization of African forces. Some of these may appear of little importance or as mere nostalgic meanderings, but experience shows that, in practice, they have much effect. Finally, the writer would submit that there are three principles of vital importance to the success of an expanded Army in Africa. These are :—

(*a*) Leadership.

(*b*) Mobility.

(*c*) Simplicity.

The aim of the expansion should be to provide, first, for the local defence and internal security of our Colonies ; secondly, a striking force for service elsewhere in the tropics when required ; and, thirdly, garrison units, in addition, to relieve British troops in tropical stations. If these three can be achieved, and on the right lines, then there is little doubt that we will have strengthened our world position and, at the same time, be applying the principle of economy of force in the employment and distribution of our available British manpower.

A NOTEWORTHY PIECE OF BLUFF

By Admiral R. Bax, C.B.

LINOIS was one of France's finest admirals. He had served in the East Indies under the brilliant Suffren and, as soon as peace was concluded with England in 1801, Napoleon sent him back there in command of a squadron with reinforcements for the garrisons of the French possessions.

In 1803, on the resumption of war, he was on the spot, ready to prey on British trade with a squadron of one line-of-battle ship and three frigates.

On 10th December, Linois and his squadron arrived at Batavia where he heard that a very valuable China convoy was shortly to leave Canton unescorted. So he proceeded to lie in wait for it off the entrance of the Malacca Straits.

The China convoy consisted of sixteen East Indiamen, ships of from 1,200 to 1,500 tons with a defensive armament of thirty-six 18-pounders and with crews of from 130 to 140 men. In addition to this there were eleven country ships attached to the convoy with two neutrals and, for escort, a fast sailing armed brig, the "Ganges," belonging to the East India Company's service.

Captain Dance, of the "Earl Camden," the senior captain in the East India Company's Service, was appointed Commodore in command of the convoy and he sailed from Canton in company with them on 31st January, 1804.

The Commodore says in his report that the journey down the river was tedious, the fleet much dispersed owing to the ships being under the directions of Chinese pilots, and that he could not keep them collected as he wished. However, once clear of the river, the convoy was assembled and proceeded in strict formation. All went well, and Pulo Auro, at the entrance of the Straits of Malacca, was sighted at daybreak on 14th February. Then, at 8 a.m., the "Royal George" reported four strange sail bearing South-West and the Commodore ordered four ships to go and investigate.

Lieutenant Fowler of the Royal Navy was taking passage on board the "Earl Camden." He volunteered to go down in the brig "Ganges" and examine the strangers. The Commodore approved, and Fowler reported an enemy squadron consisting of one line-of-battle ship, three frigates, and a brig. At 1 p.m. the look-outs were recalled and the East Indiamen formed a line of battle in close order. The "Ganges" stationed the convoy of country ships on the lee bow of the fleet and brought back many volunteers from them to help in the Indiamen.

By sunset the enemy squadron was close astern but did not attack. The Indiamen maintained the order of battle and the men remained at their quarters all night. Daybreak showed the enemy laying-to three miles to windward, so the Commodore hoisted his Colours, offering battle. The enemy replied with French Colours with the exception of the brig, which flew Batavian Colours. The line-of-battle ship was flying an admiral's flag.

At 9 a.m., as the enemy made no move, the Commodore formed the order of sailing under easy sail, on which the enemy edged down towards the British. At 1 p.m., as they evidently proposed to cut off his rear ships, the Commodore made the signal to tack in succession and engage, Captain Timmins in the "Royal George" leading the line. The manoeuvre was performed smartly, and the "Royal George" stood towards the enemy who formed very close line and opened fire on the leading ships. The latter made no reply until they had closed the range. The "Royal George" bore the brunt of the action, closing as near to the enemy as possible.

The " Ganges " and the " Earl Camden " supported her, opening fire as soon as they were within effective range, but before any other ship could get into action the enemy stood away to the Eastward under all sail.

At 2 p.m., the Commodore made the signal to chase and continued until 4 p.m. when, fearing to get too far from the Straits and in view of the immense value of the property at stake, he made the signal to tack, and at 8 p.m. anchored, ready to proceed for the entrance of the Straits in the morning.

Commodore Dance's report states that the " Royal George " had one man killed and one wounded; that the enemy fire was ill directed, falling either short or over, and that although the " Royal George " had many shot in her hull and more in her sails there were very few hits on the "Earl Camden" or " Ganges." It also states that Captain Timmins took his ship into action most gallantly, that every ship was ready and keen for a fight, and that Lieutenant Fowler rendered great assistance.

On arrival at Malacca it was found that the French squadron consisted of the " Marengo " of 84 guns, flying the flag of Admiral Linois; the " Belle Poule " and " Semillante," heavy frigates; a corvette of 28 guns and the Batavian brig of 18 guns.

The promptitude and courage of Commodore Dance and his captains saved a rich and valuable fleet from capture. The slightest indecision would have encouraged Linois to persevere in his attack. Linois' account of the action gives no indication that the ships he was engaging were merely merchant ships. Possibly the fact that three of the East Indiamen and the brig flew the blue ensign and the remainder the red ensign, and that the whole of the China ships, having been recently painted, cut rather an imposing figure, may have led him to suspect that those flying the blue ensign were men-of-war. Colour is lent to this by the information he had received before sailing, which stated that there were 23 ships in the convoy, whereas there were actually 30. However, he can have had no illusion as to the lightness of the armament of the ships he actually engaged.

Commodore Dance was a sick man when he left Canton with his convoy. The strain and anxiety of the voyage and the action with the French squadron naturally told on him. In the Straits of Malacca he fell in with H.M. ships " Albion " and " Sceptre " and was thankful to be able to turn over responsibility for the escort of the convoy to them.

The safe arrival of this very valuable convoy was a matter of national importance and the King conferred the honour of Knighthood on Commodore Dance. The East India Company and the Bombay Insurance Company rewarded the Commodore, Captain Timmins, and all the other captains with swords of honour and pieces of plate. All the captains, officers, and men received liberal pecuniary rewards, and the dependents of the man who was killed in the " Royal George " were suitably pensioned.

One cannot but feel that there was a great lack of determination on the part of Admiral Linois, but it seems that in those days, as in later times, commerce raiders were very chary of fighting an action which might entail serious damage to themselves.

TANK POLICY

By Lieut.-General Sir Giffard Martel, K.C.B., K.B.E., D.S.O., M.C.

THERE has been considerable discussion over tank policy in the Press during the past year and, indeed, it has been a controversial subject from the earliest days of the tank. Yet the matter is not really complicated or difficult. In fact, it is quite simple if a sound policy is adopted and followed and if the views of " deviationists " are not allowed to confuse the issue.

I had already started writing this paper when I saw the article " Maginobility " in the Journal for May. It is a perfect example of the confusion that arises when a number of factors are considered before the policy as a whole has been clearly set out. There are some statements in the article which are not correct but, taken as a whole, it is the lack of policy that has caused the doubts expressed by the author of " Maginobility." I will, therefore, set out the sound policy that has been followed in this matter over a period of 35 years, but with some unfortunate deviations at times. I have been fortunate enough to have been in the closest possible touch with this subject for the whole of this period, both in peace and in war, and with almost every country, including Russia. I think it will be found that this policy answers nearly all the doubts and questions which have recently been raised, including those contained in this recent article in the Journal.

Starting with the 1914–18 War, we all know that the tank was introduced as a siege weapon to break through the fortifications in France. The speed of the tank at that time was only a few miles an hour and it could only travel 20 miles on the petrol that it carried. The idea was that if the tank could enable the Infantry to break through the defences, the Cavalry and other arms would then be able to exploit the success. At Cambrai, however, we found that tanks were needed to assist in the task of exploitation as well. This could not possibly be done with the great, heavy, line-breaking tank. As a result we, at H.Q. Tank Corps in France, at once demanded that lighter and faster tanks should be produced for this role. We pointed out that fighting forces had always been divided into these two parts—the mobile troops (Cavalry) for exploitation and the slower moving, harder hitting troops (Infantry) for position warfare. It was clear at this early stage that both these would need the support of tanks. The French adopted this policy as well and with considerable success. The British, however, did not succeed in getting their lighter and faster tanks—which we called medium tanks—built and sent to France in time for that War.

After the 1914–18 War, both the French and ourselves retained that sound policy, but in each country the financial stringency was such that very little progress could be made on the material side. In our thoughts and our writings, however, there is no doubt that our Country led the World during this period between the two World Wars. We were convinced that we were returning to a time when great victories would again be won by the use of mobility. By making full use of mechanical power and armour we aimed at repeating the great successes which the Cavalry had achieved in bygone days. The Germans watched us very closely and, as far as they could do so, they copied all our ideas.

As far as the Army was concerned, the financial stringency was not lifted till just before the 1939–45 War. This was too late to enable us to be properly supplied with tanks at the start of this war, but we had retained the same sound policy. We produced the Matilda and then the Churchill tank as our heavy tanks for

position warfare, and in the early days of the War they were the best heavy tanks possessed by any nation at that time and they carried out very valuable work in assisting the Infantry in position warfare. The French produced a similar tank in the Char B. For the mobile role we were not so successful. It is much more difficult to produce a reliable high speed tank than a slower moving heavy tank. For this role we produced the Crusader, which was rushed into production while it still had some unreliable features. The only suitable engine which we could have obtained was the Rolls Royce but Air Force priority prevented us from having this engine until a much later date. The Ministry of Supply were slow in rectifying the unreliable features of the Crusader, but eventually this was done and it became the Cromwell, which was a splendid cruiser tank.

The great delay caused by the pre-war financial restrictions was also reflected in the size of our tank guns. The Germans built their first 2,000 tanks with a 37 mm. gun. We used a 2-pounder in our early tanks which was slightly larger than the German 37 mm., and we prepared a 6-pounder gun as the next step, but due to our late start it was a long time before it could be introduced.

In the early stages of the 1939–45 War, the Germans swept all before them. Poland was defeated in a few weeks and France in a month. This was achieved by the use of highly mobile forces equipped with light and medium tanks. Much the same success was achieved by the Germans against the Russians in 1941. They did not bring up any heavy tanks. There was no necessity to do so, for there was no position warfare at that stage. In the early days in North Africa we used our heavy Matilda in position warfare and the Crusader in the mobile role, and this policy worked splendidly.

As the War progressed, however, the situation changed. There was very little possibility of mobile warfare in Tunisia or Italy, and it became clear that heavy position warfare would be the role in the early stages if we landed in Normandy. The urgent necessity was, therefore, for heavy tanks and not for cruisers. The Germans appreciated this point very quickly and they changed almost their whole production effort into building heavy tanks. Even the Panther cruiser tank became practically a heavy tank. In our Country we should have maintained our sound policy of the two types, but we should also have pressed for more effort being put into heavy tanks. Indeed, the necessity for the next step after the Churchill had been apparent for some time and we had been pressing for this from H.Q. Armoured Forces. I had no responsibility for the provision of the tanks themselves while I was Commander of the R.A.C.

It was at this stage, when I had just gone to Russia, that we dropped our sound policy and a demand was made that we should have a dual purpose tank that would fill both roles. No attempt was made to push ahead with the next model of the heavy tank, though several designs had been prepared. It would have been comparatively easy to have produced a number of new heavy tanks, but it would clearly take a long time to produce a dual purpose tank, even if that was what we wanted. Major-General Briggs, who was Director of the Royal Armoured Corps at the War Office, made the position quite clear, and Mr. Duncan Sandys, who was at the Ministry of Supply, made a great effort to save the situation, but these attempts were not supported and when we landed on the Normandy beaches, although we had good cruiser tanks, our heavy tanks were quite out of date and practically useless. As regards the dual purpose tank, not even the first model had yet been made.

We all know what happened as a result of this change of policy. Our tanks

were blown off the battlefield in Normandy. I could do nothing, of course, to influence the decision while I was in Russia. This was a very unfortunate but clear instance of the harm that is done when one departs from a sound principle. Three tanks of the dual purpose type, which was named the Centurion, were completed just before the conclusion of the war in Europe. It is a beautifully built tank and very reliable, but it is, of course, bound to suffer from being a dual purpose machine. If it had the necessary armour and gun power to take on the latest heavy tanks which it might have to meet, it could not possibly have the necessary mobility for the mobile role.

Unfortunately, it is always difficult to reverse a decisio. when it has once been taken in a great concern like the Army. We remained with this decision for a dual purpose tank for five years. Fortunately, a change has now been made. We are to have a heavy tank for the heavy role as well as the more mobile tank needed in the armoured division. So far as it goes, this is a return to our sound policy, but it is very unfortunate that we have lost all these years in which it could have been developed. There is also some doubt as to whether we are now going all out on this policy to which we have at last returned. It was a failure to do so that has caused these doubts and divergent views to which I referred at the beginning of this article. Such views are often expressed by officers who have had some experience of armoured warfare for a period, under certain conditions and on one front, and they consider this to be a life experience on this subject. If they had seen this form of warfare on several fronts over long periods, and carried out by various nations, their views might be very different. I fear that it was views from these officers that caused us to change from our sound policy during the War. Let me, therefore, explain what I believe to be our true policy in a little more detail, so as to disperse the last remaining doubts or fears.

We will take the mobile role first. It is now generally agreed that the way to take on the Russians, if we should have to fight them in Europe or the Middle East, is by making use of highly skilled mobile armoured forces operating from firm bases. In this role mobility must have top priority. It replaces the numerical strength of the Russian masses. The latter are terrified of a repetition of that form of warfare which they encountered when the highly trained Panzer and mechanized forces advanced against them in comparatively small strength in 1941. We will not, however, be able to repeat those great and classic victories unless the forces which we use have the same type of mobility as that possessed by the similar German forces in the early stages of the War. They must be able to move rapidly between enemy columns or round their flanks or to attack them in rear, and they must be prepared to spend a week behind the enemy lines.

For this purpose the tank used in the armoured division must have at least the same mobility as the Cromwell or Comet tanks which we used as cruiser tanks during the War. It must have a cross-country speed of about 30 miles an hour and must be capable of going at least 160 miles on the petrol that it carries. For this role no very heavy armour is called for, as the whole policy for these mobile forces is to avoid meeting enemy strength and to use their mobility to attack the enemy wherever he is weak. The armour might even be slightly less than that which we used in our cruiser tanks during the 1939–45 War.

Having settled the questions of mobility and armour, we now come to the vital matter of the gun. There must be no question of trying to carry a gun in our cruiser tank which will take on the enemy heavy tanks. Our armoured divisions must use

their mobility to avoid meeting such tanks, and they could certainly by-pass the heavy Stalin tanks and then carry out their task. On our advance into Germany from the Normandy bridgehead, our armoured forces never engaged any German heavy tanks at all. Those tanks did not possess anything like the necessary mobility to intervene in the advance of our mobile forces. The gun used in our cruiser tanks must be a dual purpose gun, firing both H.E. and A.P., and must be the best possible gun that can be mounted in this tank without loss of mobility. The penetrative power of this gun is very important, but this does not depend entirely on the calibre. The French already have a 75 mm. with greater penetration than the Russian 85 mm. gun, and a gun of this nature is what is needed. Our cruisers must be a match for any enemy cruiser tank ; we pressed for this continually during the War, although the delays on the production side in the early days caused a feeling that our headquarters were resisting the introduction of the heavier guns that were needed, which was in no way true.

We must now turn to the heavier role of position warfare. Just as we have to be a match for the enemy in the cruiser role, so must we have heavy tanks that can deal with those of the enemy. Both in attack and defence it is essential that the Infantry shall have the call on these heavy tanks in position warfare. Although we are counting on our mobile forces to disrupt the enemy, we must be able to defend the firm bases from which they operate. At other times our Infantry will have to capture and hold important positions to act as pivots for the mobile forces. Heavy tanks are essential in both these roles.

It may be thought that as Russia now has many armoured divisions, it will no longer be possible for us to carry out the mobile role which we have suggested. It must, however, be appreciated that most of the Russian armoured divisions have very few mechanized infantry and artillery units for the support of tanks. Russia is terribly short of mechanical transport. She is very handicapped in this way in mobile warfare. When the Western Nations have raised some 20 infantry and 20 armoured divisions, which are standing at full strength in Europe, I do not believe, after my discussions with the Russians, that they would ever dare to advance against us.

If we are to succeed we must, however, be wholehearted about this new policy. There are those who say that the armoured division must be capable of breaking through defences and then carrying out the mobile role. That is part of the old and false policy. Then there are those who would slow down the armoured division by including some heavy tanks in the formation. We will never succeed unless we place mobility as the first priority for the armoured division. The Centurion tank will have many uses, but it is in no way the ideal tank for the mobile role. The length of the " tail " behind an armoured division with Centurion tanks is at present quite frightful and precludes any real mobile warfare. The position will be still worse if we add heavy tanks.

I gave these views to the Russians in 1936, and in 1944 when they were our Allies, and they have kept to this policy ever since. The French have always followed it and I think the United States are moving in the same direction. Surely we ought now to take up this line wholeheartedly and allow no more deviationists to upset our sound policy. These views have the support of many officers with long and varied experience in armoured warfare, who have been proved to have been right throughout this period.

TANKS AND INFANTRY—THE NEED FOR SPEED

By Lieut.-Colonel R. M. P. Carver, C.B.E., D.S.O., M.C.,

Royal Tank Regiment

Varieties of Infantry

SINCE the end of the War much attention has rightly been paid to ensuring that the pre-eminent position of the Infantry should be maintained in peace, to maintaining a higher standard of infantry training, and to the integration of all arms in support of the man on foot. This is all healthy and good; the Royal Armoured Corps, more than any other arm, should welcome every effort which may lead to an improvement in the standard of training of the Infantry. Some of us, however, have a fear, shared by many infantrymen, that infantry training to-day tends to concentrate too much on the operations which were found comparatively easy in the 1939–45 War and not enough on those which were the most difficult, which demanded the highest standard of infantry training, and which paid the greatest dividend for the least expenditure of human lives.

Tank soldiers, most of all those who served in independent armoured brigades which supported several different divisions, infantry and armoured, realize, perhaps better than many infantrymen, the widely varying standards and characteristics of different infantry formations and units. My own experience is a fair illustration of this. In the Western Desert from 1940 to the end of 1942 I saw in action: Guards; English, Scottish, Welsh, and Irish Infantry; motor and lorried infantry battalions, Regular, Territorial, and wartime-raised; Australian, New Zealand, South African, Indian and Free French Infantry (including Foreign Legion, Senegalese and Pacific); Greek, Jugoslav, and Polish formations, not to mention the Long Range Desert Group, Commandos, and S.A.S. In North Africa, Italy and Normandy I fought mostly alongside Regular riflemen and Territorial Home Counties lorried Infantry in an armoured division, but also supported English and American infantry divisions. Between Normandy and the Baltic the independent armoured brigade which I commanded supported or served under eight infantry divisions (three English, three Scottish, one Welsh, and one Canadian); four armoured divisions (two British, one Canadian, and one American); and two airborne divisions (one British and one American). In addition I had placed under my command at various times English, Scottish and Welsh Infantry and lorried infantry battalions, a Royal Marine Commando, a Belgian and a Dutch brigade. I had, of course, my own motor battalion of riflemen all the time.

If I had been asked at the end of the War, or were asked now, in what particular I found the greatest difference between the varieties of Infantry, I should have said that it was in the speed at which they could lay on and execute an operation and in the initiative shown by the junior commanders. The standard in airborne, motor, and lorried infantry was generally higher in these respects than in infantry divisions. The standard within infantry divisions varied immensely, from those which equalled or surpassed mobile or airborne formations to those which were agonizingly slow. If, again, I were asked what was the greatest need of the Infantry to-day, I should say that it was to bring all British Infantry up to the standard reached by the best in these characteristics. This standard was not only reached at the end of the War: it was probably at its highest in the Eighth Army at the end of the North African campaign. There were many occasions in North West Europe when I could not help

wondering what fate some of the more stately formations would suffer if they had to consider a serious counter-thrust by the enemy, or try and compete with the sort of operations we had to undertake in the desert before Alamein. Five hour "O" groups would be of little value then.

Functioning of Command

The Germans and the Americans both rightly accuse us of being ponderous in action. It is quite wrong to assume that this is a national trait—the stolid, phlegmatic Briton and the rest. When trained for mobile and rapid warfare, the Briton is second to none. The main reason is that we have not, even yet, sloughed off the effects of the 1914–18 War. The difference in outlook and method between those who started the War in the desert, where failure to act quickly led inevitably to capture or worse, and those who had trained for many years in England, was most noticeable when we got to Tunisia, Italy and Normandy. The tendency of training in peace, or in England in war-time, to hold extensive post-mortems after exercises, to stress the importance of careful planning and detailed foresight, and to see that everyone is in the picture, important as these factors are, led, and still leads, to the lengthy and detailed conferences and "O" groups and the meticulous planning which is so often criticized by Americans and causes so ponderous a functioning of the military machine. Contrast it with Rommel's method of command and note the results. This criticism is not confined to the Infantry: many armoured formations, particularly army tank brigades, were equally ponderous.

Mobile Warfare

First among the causes of slowness on the battlefield, therefore, is the ponderous functioning of command, a legacy of the 1914–18 War. Second is our general conception of land warfare, also a legacy of that War, unfortunately reinforced by a good deal of experience in the 1939–45 War in such theatres as Italy and the Far East, and aggravated by the sort of operations in which the Army has engaged, since the end of the War, in Palestine, Malaya, and Korea. In discussing this, it is as difficult to maintain a central, reasonable, and realistic attitude, without being misunderstood, as it is in politics. One is accused by the extreme advocates of mobility of pandering to the 2½ m.p.h. mentality of the 1914–18 War and by the average infantryman of trying to resurrect a discredited theory that wars can be won on the cheap by mobility alone without the Infantry.

The basic principle, which was as true thousands of years ago as it is to-day, is that the pitched battle is not itself decisive unless it leads to the conditions in which mobile forces can be employed. Unfortunately, history and the popular conception of war on land throw the limelight on the pitched battle, and only students of war, as a rule, study and remember the moves which precede and follow. But it is those moves which force the decision. That, surely, is the main lesson to be learned from the experiences of 1914–18—and from the *Iliad*. Attrition is a wasteful, indecisive and despairing method of warfare, in which victory, if it comes at all and is worth having when achieved, goes to those with the greatest reserves of manpower. To take only one example: the Battle of Alamein was not of itself decisive until it led to the conditions in which we could employ our mobile forces. It was the pursuit after Alamein which decided the campaign in Africa. If this principle is kept firmly in the back of one's mind, and the set-piece battle is seen as the means of creating as

rapidly and cheaply as possible the conditions of mobile warfare, one gets one's values in proper perspective, and the importance of training, organizing, and equipping one's army for mobile warfare becomes evident.

Training

Let us take training first. There is a tendency to divide operations up into those executed by infantry divisions—the set-piece and " dog-fight " battles, carried out at infantry pace with Infantry as the primary arm, supported by tanks on the basis of an armoured regiment to an infantry brigade—and the pursuit, carried out by armoured divisions with tanks as the primary fighting arm, supported by Infantry, and to imagine that there is a clear-cut division between the two. The fact that there may be mobile battles or a period of mobile warfare, which is neither pursuit nor withdrawal, is often forgotten. There were many such battles on the Russian front during the War: the campaign in France in 1940 was another. Perhaps the best example in our own experience was the prolonged battle round Tobruk in the Summer of 1942, often called the Battle of Gazala.

The result of this is that training tends to concentrate on the set-piece battle for the infantry division and the pursuit for the armoured division. Although the former involves very intricate and detailed staff work and the most intimate integration of all arms, both are fundamentally simple and comparatively easy, as they are not possible without a considerable degree of superiority over the enemy. The real test of quality in leadership and training comes in all the many various types of operation between the two, which will be the decisive stages. It is these stages which seem to be neglected in training, principally, perhaps, because they are extremely difficult to practise with any realism. Neglect of training for this type of action, however, may prove disastrous.

Organization

This attitude has also a serious effect on organization, particularly in the armoured division. Success in these operations depends very largely on speed, for it is only by superior speed that the initiative can be seized and maintained. It must be the constant aim of all concerned to develop operations as rapidly as possible beyond the speed of the man on his feet and to prevent them from returning to that tempo, not only because a man on his feet moves so slowly, but also because the speed of control is inevitably so slow in dismounted operations. Speed on the battlefield is not solely, nor even primarily, dependent on the actual m.p.h. which tanks or other vehicles can achieve. It depends most of all on speed in acquiring and disseminating information, making decisions, issuing and transmitting orders and, most important of all, in translating them into action.

One of the chief, if not the chief, causes of delay is that of reorganization within units and formations in order to execute orders received. The process of " marrying-up " different arms to suit the requirements of the task, particularly if they are not accustomed to fighting together, can be very lengthy, involving not only tactical grouping, but also signal and administrative arrangements. Failure to " marry-up " properly will lead to failure in the execution of the task. It is, therefore, of vital importance that the normal organization of a formation should suit as wide a variety of tasks as possible, and it is here that the proper balance of Armour and Infantry becomes of extreme importance.

In the set-piece battle, particularly if minefields have to be cleared, Infantry

is generally the primary fighting arm and a proportion of one squadron of tanks to one battalion, considering the area of ground covered, is normally both suitable and sufficient. At the other extreme, in the pursuit, if the country is very open and if opposition is light or completely disorganized, it may be possible to operate an armoured brigade with only the support of one motor battalion. Under these conditions a greater proportion of Infantry will only tend to slow down the tempo of operations. In any but very open country or where there is practically no opposition, as we discovered in North-West Europe, a higher proportion of Infantry to tanks will probably be needed, particularly now that we have to face the menace of the bazooka-type weapon.

The experience of North-West Europe led almost all armoured formations to adopt a standard brigade formation of two armoured regiments and two infantry battalions, the latter motor, lorried, or normal infantry battalions, carried wholly or partly in armoured personnel carriers or on the backs of tanks. This had been the standard formation of the German Panzer division for a long time. The brigade was formed into two groups, each consisting of an armoured regiment and an infantry battalion, and within the group squadrons and companies were " married-up " into squadron-company groups. Almost all, Armour and Infantry alike, who experienced this formation came to appreciate how extremely effective it was for a very wide variety of operations. I personally employed it with great success in conditions as different as the " dog-fight " and "break-out" in the bocage of Normandy; the second stage of the clearance of the area between the Maas and the Rhine in February, 1945, a set-piece battle in the most difficult conditions of ground and weather; the "break-out" from the Rhine bridgehead; and subsequent operations up to the Baltic. That this combination of mobility, fire-power, and ease of control, with the decisive characteristics of Infantry, could be employed in such a variety of conditions without any reorganization was a decisive factor in speeding up operations and in raising the standard of co-operation between Armour and Infantry to a very high degree. The only operations for which it was not suitable were prolonged defence or where the existence of major obstacles, such as defended minefields, rivers, or ground impassable to tanks, prevented the full employment of tanks. Although these conditions occurred fairly often, they were of short duration.

The Formation of the Future

It seems to me, therefore, that success in the decisive stages of land warfare depends on our ability to employ this type of formation effectively. We shall not be able to do so unless we train for it and are organized on that basis. It does need a very high degree of training, particularly in the Infantry, demanding a far greater speed of thought and action and a higher degree of initiative on the part of company and platoon commanders than is normally achieved as a result of training for the set-piece " Infantry Battalion in the Attack." It demands from both Armour and Infantry a very high standard of wireless discipline and battle drill generally.

It is, perhaps, most unfortunate that, at present, the armoured division is organized with the tanks all in one brigade and almost all the Infantry in the other. On rare occasions (very rare in Europe) the armoured brigade might fight as a whole, but the infantry brigade never without at least one regiment of tanks. For the vast majority of operations I am sure that the division should be organized as two identical brigades, each of two armoured regiment-infantry battalion groups. If that is how they will fight, that is how they should normally be organized. I am not

impressed by the argument that an " armoured " brigadier must train and normally command and administer the Armour, and an " infantry " brigadier the Infantry. It is only by training and commanding other arms that the commander who has to lead them in battle will learn to understand them fully. The present system only tends to perpetuate the undesirable reluctance of Armour and Infantry to serve under each other's commanders, a reluctance which, as a result of the present system, is unfortunately only too often well-founded.

It is not, however, only in armoured divisions that a change in outlook is needed, but also in infantry divisions and independent armoured brigades. There is far too general a tendency to think that the only way to employ an independent armoured brigade in an infantry division is to allot one armoured regiment to each infantry brigade and leave it at that. In the initial stages of a set-piece attack, that will normally be the right answer ; but I am sure that it should be the aim of every infantry divisional commander to employ his armoured brigade as a brigade, by the addition of an infantry battalion, carried in armoured personnel carriers if possible, at the earliest opportunity, and also perhaps to form a second armoured brigade with two of the armoured regiments under an infantry brigade, the third battalion of which is under the armoured brigadier. Unless this is done, there is always the danger that the set-piece battle will never get beyond the " dog-fight."

The process of passing an armoured division through an infantry division to achieve the " break-out " is a complicated and often a slow business, which is apt to lead to loss of momentum and initiative. The infantry division must start the " break-out " itself with its own Armour and must be prepared to fight a mobile battle thereafter. Success in these vital operations depends on rapid decision and action, on the ability to create, seize, and exploit opportunities with the least delay. This will only be possible if all arms, particularly Armour and Infantry, are trained, organized, and equipped to this end. With the number of armoured formations and units in the Army being increased, now is the time to concentrate on this type of training.

MOBILE AIR FORCES

By Air Marshal Sir Thomas Elmhirst, K.B.E., C.B., A.F.C.

AIR forces in war, defending or attacking from a secure or island base, operate at their highest efficiency when working from permanent, fully equipped airfields. But the changing fortunes of a long war may well leave such an island base high and dry and out of range of attackers, and a defending air force thus becomes of little use unless moved nearer to the front. The chance of finding well-equipped airfields close behind a battle front is possible, but by no means likely, and an air force that is to operate in support of an army in the field may well have to advance or retire, making airfields in accordance with army movements, and rely on its own resources for making such airfields and for the maintenance and supply of its aircraft.

Such an air force must be mobile, that is, its ground organization must be as transportable as that of a road travelling circus, which never rests for more than a week on one site and can pack up and be on the move at six hours' notice and operate as efficiently on the morrow. In fact, a field air force has to be even more mobile than a travelling circus, as the latter does not function when on the move, while aircraft must continue to operate while the ground parties and equipment are on the road.

A field air force that is not completely mobile will suffer from one or other of three main disabilities. First, a very rapid advance of the Army—and such advances have been 50 to 100 miles a day—may well leave the original airstrips or airfields, from which short range aircraft were operating, so far to the rear that aircraft may not be able to give support over the line. Even if they are just able to do so, the support they give is limited both in time spent over the battlefield and in depth of penetration beyond. Again, the weight of missiles the aircraft can carry will be much less if long-range tanks have to be fitted, and the long distance to and from the front line from bases far behind will cut down the number of sorties that can be flown each day and will entail a lot of useless "engine hours." Secondly, an immobile air force will have its forward airfield overrun if enemy columns break through and, though aircraft may be able to fly to the rear, valuable men, equipment, and stores will be captured which, until they are replaced, will render the air force valueless. And lastly, when an army headquarters and an air force headquarters are co-operating in the field they must be sited and moved together. The army headquarters must, of necessity, site itself and move forward and backward in accordance with the moves of its subordinate formations. The air force headquarters must conform to the moves of the army headquarters and is therefore likely to be within, say, 50 miles of the front line. But, if an air force headquarters is properly to control its subordinate formations of wings and squadrons, it must do so by telephone and, accordingly, must have them located reasonably close. If wings and squadrons cannot move and be sited to conform to the moves of their own headquarters, operations will suffer.

The Allied campaign in Tunisia in February, 1943, is an example of the unfortunate consequences due to the poor mobility of the air forces engaged. The Royal Air Force contingent supporting the British First Army was located too far back (at Bone) where, though the aircraft well defended the "forward base" from air attack, they were unable to operate far enough forward to ensure air support to the troops. Again, the United States Air Forces on the right of the line were,

though not fully mobile, located too far forward. Consequently, when German armour made a rapid advance through the Kasserine Pass, airfields were overrun and men, equipment, and supplies were captured because the units were not practised in quick moves, nor had they sufficient vehicles at hand to convey themselves and their equipment to the next set of airfields prepared for them in the rear.

The Royal Air Force learned its mobility lessons in the North African Desert campaigns of 1940, 1941, and 1942. It learned how to move its wings and squadrons quickly from one airstrip to another in conformity with moves of the Army. It learned how to keep the squadron aircraft operating when the ground parties were on the road, and how to ensure that squadrons were kept up to strength with serviceable aircraft when far distant from a supply base. Likewise it learned to ensure a steady flow of all those supplies and spares without which an air force cannot operate, and, with the assistance of the Army, how to construct airstrips quickly from virgin soil or desert. These lessons were only learned after much trial and error and as a result of experience, sometimes bitter. It is well that they should not be forgotten. But they will be forgotten unless the organization is in being and, besides being on paper, the special types and numbers of vehicles are available and units are practised in their various mobile duties.

In the main, mobility of a field air force depends on correct organization, that is, having the right type and number of units supporting the wings and squadrons, and a sufficient number of motor vehicles and tents of the necessary type. Air transport can help, if available in numbers and if local air superiority allows its use, but it is not the final answer. Heavy cranes, heavy refuelling vehicles, heavy special signal vehicles for control of fighters in the air, are not easily or readily transportable by air.

The following paragraphs give a short summary of the organization required to ensure the mobility of a field air force.

The fighting unit of the Royal Air Force in the field is the wing, comprising two, three, or four squadrons equipped with the same type of aircraft. Fighter-bomber squadrons usually have an establishment of some 16 aircraft each and a wing will thus consist of some 50 to 60 aircraft in all. A typical field air force supporting a two-corps army might well consist of :—

A group headquarters, with its subsidiary group control unit. The latter is necessary for the hour-to-hour control of aircraft in the air and for the control of the necessary early warning system and A.A. defence of airfields. Three, four, or more fighter-bomber wings, a reconnaissance wing, and perhaps one or two light bomber wings if these are not under the immediate control of the superior air commander, and a communication squadron for the rapid conveyance of staff officers, both army and air. In addition, there must be the necessary units for air defence of airfields, perhaps a squadron of light A.A. guns for each airfield, an air formation signals unit for laying telephone lines between group headquarters, wings, and squadrons, and an airfield construction unit.

Over and above the operational units mentioned above certain administrative units are essential to ensure that the squadrons are kept up to strength in serviceable aircraft, men, and vehicles, and are supplied with the necessary spares, stores, fuel, bombs, ammunition, etc. The following administrative, or ancillary, units all play their part, and a group in the field cannot function efficiently without them :—

Air Stores Park. One should suffice for four wings, holding the necessary aircraft spares and camp equipment stores.

Fuel and Ammunition Park. One should suffice. It should hold, in addition to aircraft fuel and explosives, oxygen-making apparatus, paraffin, and M.T. petrol (if this latter is not supplied by the Army).

Advanced Repair and Salvage Unit. One of these should be provided for every two wings. The unit should be located on a wing airfield with a detachment on the airfield where the second wing is located. It carries out repairs to wing aircraft where more than 48 hours' work is entailed. It does not carry out repairs that will entail over a week's work, but returns such aircraft to base. It effects the salvage of all crashed aircraft of the wings it looks after.

M.T. Repair and Salvage Unit. One should suffice. The unit works to the same principles as an aircraft repair and salvage unit. It should hold M.T. spares and a small immediate reserve of M.T.

Signals Repair Unit. A small unit to carry out all repairs of signal equipment beyond the capacity of wings, and to hold signals spares.

Field Hospital. A 30- to 40-bed mobile hospital.

Supply and Transport Column. A unit of at least 200 three-ton load carrying vehicles for transporting fuel and explosives from rail- or road-head to the fuel and ammunition park, also for the pre-stocking of forward airfields and for the moving forward (or to the rear), as necessary, of the fuel and ammunition park stocks.

Group Support Unit. A unit located in the back areas out of range of enemy fighters to hold an immediate reserve of three aircraft and three pilots per squadron of the group it is supporting, and a " flight " of aircraft in which reserve pilots can maintain themselves in practice.

All these ancillary units need to be organized and established to contain the correct number of officers, airmen, equipment, stores, fuel, repair facilities, etc., to meet the requirement of a whole group for a month's warfare. There may be, however, two exceptions to the rule that all units of a group, both operational and ancillary, must hold sufficient vehicles to be able to transport themselves at a few hours' notice. Light bomber wings and group support units can and should usually be located far enough back to be out of the immediate war area. As such they should have good warning of the need to move and can be aided in their movements forward or back by vehicles lent to them temporarily.

Whilst speaking of vehicles, it is well to remember that many are required and that they are expensive. A wing on the move with its own two days' supply of ammunition and fuel will need at least 100. Vehicles are often idle but, if not present and available, ground parties may well be captured or an air force rendered inoperative due to the distance of its airfields behind the front line. Vehicles, in the main, are the ordinary three-and-a-half-ton commercial load carrier. Towed trailers should not be allowed. Vehicles for special purposes, such as signal vehicles, vehicles carrying machine tools or oxygen-making apparatus, stores-carrying, kitchen, and office vehicles, should be fitted up inside so that their special stores and equipment can be issued from them, or be made use of, without the vehicle being unpacked. A few large petrol tankers are an asset and so are large 10-ton load carriers for the moving of fuel and ammunition dumps, if roads will carry them.

Two other organizational requirements for a mobile air force must be mentioned. First, the split headquarters, and secondly the method of ensuring that wings and squadrons can still carry out their daily operational sorties while their ground parties are moving on the roads from one airfield site to another.

Experience in the 1939–45 War proved that the headquarters of a field air force must at times be able to control its units with the headquarters split into two parts, one located forward with the army headquarters near the front line, and the other located 100 to 200 miles to the rear on the line of communications to the base. No one likes a split headquarters. It makes the help and control of units more difficult and hinders that close co-operation so necessary between all headquarters staff departments. But a split headquarters, each part having its own establishment, was found necessary in both the Army and the Royal Air Force in all the quick-moving campaigns of the 1939–45 War, in North Africa, Sicily, Southern Italy and North West Europe.

The complete headquarters of a group or tactical air force is a large unit with its operational and administration staffs, its signals, its clerks, cooks, drivers, its vehicles and tents. In fast-moving warfare, it is essential that the Air Commander and his operational staff are located alongside the Army Commander and his operational staff, and it is likewise essential that the latter are located within 30 or 40 miles of the front line troops. If a whole army and an air force headquarters were together, they would need a very large tented encampment or a town of some size to accommodate them. The whole would be an unwieldy outfit, bound to be spotted by the enemy and to become a target for day and night air bombardment.

Again, in fast moving warfare, a headquarters might of necessity move once or twice a week, thus disorganizing the whole staff and preventing the administrative staff from keeping in close communication with the base and ensuring the smooth flow of the group's supplies. Practice in the War showed, therefore, that unless the front line was static, and looked likely to remain so for weeks ahead, it was advisable to split the headquarters into a small forward party, consisting of the Commander, his operational staff and his Chief of Administration—the latter with only three or four staff officers—and a rear party consisting of the remainder of the staff and located, perhaps, 100 miles behind, where they could get on with their work in quiet conditions in good telephonic communication with their base or next superior headquarters. Rear headquarters would probably only move once to two, three, or four moves of the forward headquarters. Very good communication is, of course, essential between the two parts of the headquarters, with telephones where and when possible in addition to wireless and a daily air-letter service.

The other essential requirement of a mobile air force is the need for wings and squadrons to retain their fighting capacity, even when their ground parties are on the move between airfields. This is purely a matter of organization and of the provision of a slightly larger establishment of men and vehicles. The wing produces a written organization ready to hand, whereby at a moment's notice it can divide itself into two parties and send one moving down the road while the other maintains the aircraft carrying out their normal daily operational sorties. The two parties can live apart for some 36 hours, but beyond that period the party maintaining the aircraft will, through overwork, become tired and the rate of sorties for the wing will, and must, drop. On the order being given for a wing to move, the forward or "A" party, consisting of about half the mechanics with a rather larger proportion of signals, A.A. defence, etc., move off by road to the new airfield. The remaining

" B " party work overtime to keep the aircraft in the air. On arrival of " A " party at the new site, it ensures that the airfield is fit for aircraft to alight on, erects the necessary signal installations, prepares the A.A. defence, and sees that the airfield is stocked with fuel and ammunition. When this is accomplished, it signals to " B " party that it is ready to receive aircraft. The wing aircraft, at the conclusion of the sortie they are engaged upon, then land at the new airfield and " B " party packs up the old camp and rejoins " A " party as soon as possible. " A " party, of course, have to work double time to keep the aircraft in the air while " B " party is on the road. If air transport is available, and air superiority allows its use, then some time can be saved by moving a proportion of the " B " party by air. But heavy equipment, tents, refuelling vehicles, cranes, signals vehicles, etc., will, for a big force, of necessity have to move by road.

To sum up. In times of peace all air forces are inclined to become static. Squadrons may move from one to another well-established and well-equipped permanent airfield. Little more is expected of them. In time of war, it is certain that a fair proportion of an air force will, of necessity, be called upon to operate with an army and to operate from hastily prepared airstrips rolled out of virgin soil in an unexpected war area.

To be able to function in the manner indicated is a simple matter if the necessary organization and establishments, besides being on paper in a mobilization scheme, are occasionally brought to light, and if units of the different types are sometimes formed (if only in skeleton) and provided with vehicles and made to live, move, and carry out their functions away from normal aids. If units are not so practised, there will be confusion at the outset when they move into the field and operations will suffer, if only because officers and men are unused to erecting tents and cooking their meals without the usual kitchen stove!

THE BUILDING OF A RESERVE BASE

By Major-General D. A. L. Wade, C.B., O.B.E., M.C., B.A., A.M.I.E.E.

On the formation of South East Asia Command in November, 1943, G.H.Q., India, handed over operational control of the Burma theatre of war and its main task became the provision, maintenance, and training of the men and material at the disposal of the Supreme Commander S.E.A.C. In effect India became a vast Base and, with an eye to future operations for the reconquest of Malaya and the Dutch East Indies, the centre of gravity of the maintenance system shifted southward down the Peninsula to make full use of the ports of Vizagapatam, Madras, and Bombay, in addition to Calcutta.[1]

As the key to the future maintenance plan, additional Reserve Bases were projected in the vicinity of Calcutta and Madras, with a transit depot at the smaller port of Vizagapatam. The object of this article is to give a brief description of the administrative problems involved in the planning, construction, and operation of the largest of these Bases, namely No. 4 Reserve Base near Madras.[2]

Planning

Preliminary reconnaissance for a suitable site commenced early in 1943, and in May a joint planning team arrived in the selected area to determine the detailed lay-out in accordance with the requirements laid down by " Q " Plans, G.H.Q. The Base was required to accommodate reserves of all types of stores, ammunition, supplies, and petrol required for the Army and R.A.F., together with certain R.N. stores needed for landing and port development. The head of the planning team was the late Brigadier C. Cobb, who subsequently remained as commander of the Reserve Base during the constructional period. The target date set for completion of the Base was June, 1945.

The area selected by H.Q. Southern Army was adjacent to the small village of Avadi, 20 miles West of Madras. It adjoined the main Madras–Bombay line of the Madras and Southern Mahratta Railway. The main Madras–Bangalore road was some four miles distant from the western edge of the area. The site comprised about 27 square miles of open paddy land with a gentle slope falling from North-East to South-West. A large jheel in the centre of the area with a canalized spill-way facilitated surface drainage in the monsoon. The area contained only a few small habitations, apart from two existing installations near the village of Avadi. These were a Base Ordnance Depot and a Civil Labour camp. The latter was owned by the Malayan Government and was formerly used as a collecting centre for Tamil labour.

Ample water supply was available from Redhills Lake (the main reservoir for Madras City) and from subterranean sources in the vicinity. No electric power existed apart from a small plant feeding the Malayan camp and power was subsequently provided by two Diesel-operated stations.

By June, 1943, Brigadier Cobb and his staff had moved into the Malayan camp and shortly afterwards work commenced on the construction of railways, roads, surface drainage, and water and electric supplies.

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[1] For a full account of the development of India as a Base see lecture by Lieut.-General Sir Wilfred Lindsell, R.U.S.I. Journal, May, 1947.

[2] The other Reserve Bases were No. 1 Lahore, No. 2 Benares and No. 3 Panagarh (near Calcutta).

Transport

All depots were to be rail- and road-served. This involved the construction of some 125 miles of broad gauge track and over 100 miles of main tarmac roads. In addition, to give ready access to Madras Port, a new main road was constructed from the Base to the outskirts of Madras City. Rail construction was carried out by the M.S.M. Railway, assisted by a Railway Survey Coy., R.E. The Director, Transportation, G.H.Q., seconded back to the M.S.M. Railway one of its own engineers to take charge of the work. In the final stages the M.S.M. Railway operated the marshalling yard and spurs with a fleet of 14 locomotives. All other construction was undertaken by civil contract under the C.R.E. Avadi.

Constructional materials arrived by rail, were dumped, and subsequently moved to the site by a mixed fleet of military and civil three-tonners. The latter proved unreliable and costly. They were subsequently replaced by Civil M.T. companies. These companies comprised specially recruited drivers who, while retaining their civilian status, received military rations and accommodation. Each company was commanded by a military officer. This para-military organization worked on the whole with astonishing success. Needless to say, the efficiency of any particular unit varied with the personality of its lone R.I.A.S.C. officer.

As the work of construction progressed, the calls on transport increased to include personnel-carrying. The majority of the constructional labour lived in Madras. They arrived and departed daily by train; but for many their journey was not by any means completed, since their work might lie anything up to 8–10 miles from the railway station. To avoid wasted man-hours, road transport had to be provided to complete the journey. At the peak of construction the strain on transport reached a critical stage.

Owing to the heavy wear and tear on vehicles, unit and second-line workshops became overloaded. The strain of long working hours was beginning to tell on drivers, and the sickness and accident rates were rising steadily. Furthermore, owing to the shortage of light vehicles, 3-tonners were perforce being uneconomically employed as personal transport for supervisory personnel. Due to a combination of these factors the daily figure of ton-mileage started to fall alarmingly. Additional vehicles and drivers could not be made available.

It was, therefore, decided to break away from the conventional unit organization and to form a pool of M.T. operating on the central garage principle. The resources of all companies in drivers, vehicles, and workshops were placed under the operational control of a single commander. Irrespective of unit organization, drivers were allotted to vehicles for a definite working period and then relieved by fresh drivers. Maintenance, both daily and weekly, became the sole responsibility of the workshop pool, the driver's only responsibility being that of reporting any defect in his vehicle on his return to lines. The sole object was to obtain maximum ton-mileage while spreading the man-hour load equally over all driving and workshop personnel.

As an emergency measure the system was fully justified by results, but as a long term policy the disadvantages of breaking up the unit organization cannot outweigh the advantages of the personal responsibility of the unit commander for his men and vehicles and of the driver for his own vehicle. Concurrently with the pooling of M.T., a resourceful C.R.E. decided to usurp the functions of Supplies and Transport, and " off his own bat " scoured the country for donkeys and leaders to supplement his transport resources. His efforts were amply rewarded, as no doubt were the

owners of the donkeys! The methods whereby he eventually placated the auditors are best left unrecorded. As an example of improvization to meet exceptional circumstances, the above incidents are perhaps worthy of record.

Depots and Accommodation

To return now to the constructional side of the Base. The original plans provided for the following depots :—

Engineer Stores	... ...	300,000 tons
Supplies	... ...	72,000 ,,
Petrol	... ...	50,000 ,,
Ammunition[3]	... ...	30,000 ,,
Ordnance	... ...	90,000 ,,
R.A.F. Stores	... ...	100,000 ,,

Depots for medical, veterinary, and N.A.A.F.I. stores and salvage were also provided.

In the Summer of 1944, G.H.Q. produced new plans to cover extensions to existing depots and certain new installations, including a Vehicle Reserve Depot (18,000 vehicles), a R.E.M.E. Base Workshops, and a Returned Stores Depot for the repair of unserviceable articles of clothing and equipment. These new projects, launched mid-way in the constructional stage, provided additional " headaches " for all concerned and, as will be shown later, had a serious repercussion on the water supply.

In addition to the depots, accommodation had to be provided for the personnel required to operate and maintain the Base. These amounted to 7,000 British and 15,000 Indian troops, together with 13,000 civilian labourers. These in their turn required certain installations for their maintenance which could not economically be provided from Madras. They included a Station Hospital (800 beds), Supply and Petrol Depots, and I.E.M.E. Workshops.

In addition to its function as a Reserve Base, Avadi included a transit hospital area of 3,600 beds. These were found by three General Hospitals (one British and two Indian). Their purpose was to act as a buffer on the casualty evacuation route between Madras Port and the hospital town at Jalahalli, outside Bangalore, by receiving severe cases and by holding any overflow of patients who could not be evacuated direct from hospital ships by the limited rail facilities.

The types of buildings for stores and personnel were naturally dictated by the necessity of making the fullest use of local materials, and the avoidance of importation from overseas. The latter was unavoidable in the case of the steel-framed and corrugated iron hangar-type sheds required for the R.E.M.E. Base Workshops, and for certain of the more valuable R.A.F. stores and equipment, such as engines, air-frames, and parachutes. For all other types of stores, multi-bayed sheds of brick, timber, and Mangalore tiles, or Romney huts, were provided. For personnel, the bulk of accommodation comprised either huts with 4-foot brick walls surmounted by basha (plaited palm leaves) and Mangalore tiled-roofs, or pre-fabricated Cross huts.

For the hospitals, brick with asbestos-sheeting roofs were normal for operating theatres, specialists' blocks, and a proportion of wards; the majority of the wards were, however, tented with concrete plinths. All living accommodation (including

[3] The Ammunition Depot was situated in a separate area, 28 miles North of Madras, adjacent to the village of Gumminipundi on the main Madras-Calcutta railway.

tented-wards) and workshops were provided with electric light and fans. Electric light was also provided in all sheds to permit of night working.

The use of tented hospital wards under the trying climatic conditions of South India was officially justified on the grounds of expediency and economy, in view of the fact that the hospitals were for transit patients only. In the writer's opinion the additional time, labour, and materials required for hutted wards would have been well spent. Fortunately, as events transpired, the hospitals were never fully occupied, but patients, and perhaps to a greater extent the nursing staff, suffered unnecessary strain from their working conditions.

Organization

At the outset, G.H.Q. retained in its own hands the responsibility for planning, while delegating responsibility for construction to H.Q. Southern Army. In consequence, Brigadier Cobb became responsible to three masters. As a staff officer of the Q.M.G. he was answerable to the latter for planning and lay-out; for construction he was answerable to H.Q. Southern Army; and for local administration and discipline he was answerable to H.Q. Madras Sub-Area. No man can rightly serve two masters, much less three. Brigadier Cobb provided no exception to this rule. His position was further aggravated by the fact that one master resided at Delhi—some 1,800 miles from Avadi. In the late autumn of 1944, with the influx of administrative units on top of the already considerable garrison of technical units, the difficulties inherent in over-centralization and divided control reached a point at which a change in organization became essential. Eventually G.H.Q. agreed to release Brigadier Cobb as a staff officer; H.Q. Southern Army decentralized their responsibilities to H.Q. L. of C. Area, and Avadi became a Sub-Area directly under the Area Commander. G.H.Q. merely retained control of planning, the bulk stocking of depots, and contract approval for those major works which exceeded the financial powers of the Area and Army Commanders respectively. Henceforward the system worked smoothly.

Labour

By the Autumn of 1944, railway construction was virtually completed and some of the depots were sufficiently advanced for stocking to commence. It had at an early stage been appreciated that the provision of the large amount of labour needed to handle stores would prove a formidable problem. Local labour was not available and the daily transport of large numbers to and from Madras, additional to those already employed on construction, was beyond the capacity of existing road and rail facilities. Owing to the increasing length of the L. of C. to Burma, the demand for pioneer units was outpacing their supply. None could be spared for Avadi.

The Government of Madras stepped into the breach and undertook to recruit the necessary labour, if the Army would provide accommodation, food, and clothing. This offer was gladly accepted; and recruiting for the Madras Civil Labour units started. A depot was established in the vicinity of Madras. Here the labourers assembled and, after medical inspection, documentation, and the issue of a bare minimum of kit, they were formed into units of 1,000 strong. These were subdivided into companies and platoons. Unlike the Civil M.T. companies, no military commander was provided, all officers and n.c.os. being appointed by the civil authorities. As soon as units were up to strength they moved into Avadi and commenced work.

At first the scheme looked likely to prove a failure. The desertion rate rose alarmingly. Investigation soon revealed the cause. An over enthusiastic staff officer, not realizing that the units needed breaking in, had allotted them long working hours right from the start. Many of the men were still suffering from the effects of the famine of the previous year, and a daily civilian rice ration, approximating to half their normal peace-time diet, had proved insufficient for their full recuperation. Their physique needed building up before they would be fit to undertake heavy manual labour. A contributory cause was the coincidence of local religious festivals, for the celebration of which the men regarded it as quite in order for them to return to their homes and families.

These teething troubles having been overcome, the units settled down to work with a will. They soon acquired the elements of military hygiene and discipline, and sympathetic handling engendered an appreciable *esprit de corps*, which manifested itself in the keenness with which units competed against one another in games and the standard of cleanliness of their lines. The sight of long columns of these semi-uniformed "troops," each man armed with a small towel to act as a sweat-rag, marching (more often than not in step) to and from their work became a familiar feature of the Avadi scene. Undoubtedly the scheme was a success.

Water Supply

As previously stated it was originally estimated that ample water was available in the vicinity of the Base. The method of supply was by four Diesel pumping stations feeding into four sets of storage towers. Consumption had been based on a figure of about 30 gallons per head per day. Early in the summer of 1945, when the Base was approaching full operational conditions, a water crisis arose. Although the pumps were working to full capacity the pressure in some unit lines was insufficient to produce more than a trickle at the taps and the railway authorities complained bitterly that the supply to their stand-pipes was insufficient to replenish locomotive tanks, and that traffic was suffering in consequence.

Emergency measures were immediately applied. A system of water cuts was imposed; storage tanks were provided for locomotive stand-pipes; and an urgent demand for further pumping machinery was placed on G.H.Q. Investigation proved that the main causes of the trouble lay in faulty planning. The original water supply had naturally been based on the plans for the Base as envisaged in 1943. When the expansion programme was received from G.H.Q. in 1944 the mains had already been laid and, apart from additional pumps, the original water plan was allowed to stand except for minor adjustments affecting distribution. The margin of safety in the capacity of the mains and storage tanks was insufficient to compete with the additional load. The only possible remedy lay in the provision of larger mains. At this late stage this was impracticable. Contributory causes were found to be careless use of water taps by coolie labour and leakages in the mains and distribution system. Despite the enforcement of strict water discipline, the shortage was never overcome

Security

The problems of security of a major installation on the L. of C. in war fall under three headings:—

(1) Security against armed attack by guerillas or paratroops.
(2) Security against sabotage by enemy agents.
(3) Security against pilferage.

(1) and (2) provided no special problems in the case of Avadi and call for no comment. Security against pilferage, however, provided some lessons which may be of interest in the future under similar circumstances, i.e., where depots are to be located in isolated and scattered areas and operated largely by local labour.

The problem resolves itself into the material and personnel measures required. These will vary in accordance with the nature and portability of the stores to be guarded, and the lay-out of the depot in which they are situated.

In brief, the material measures provided in all depots at Avadi comprised a single barbed wire fence, 8–10 feet high, surrounding each depot, with one, or at the most, two entrances permanently guarded ; and expanded wire-metal cages in those sheds containing particularly attractive stores, e.g., watches, small arms parts, etc. On the personnel side, security resources comprised one Field Security section, four sections of military police, and in each depot a security officer, assisted by a varying number of specially trained n.c.os. and men, whose duties included the power to search all labour entering and leaving their depots.

In general, these measures, combined with the normal system of armed guards, sufficed to reduce pilferage to a minimum, except in the case of the Vehicle Depot. This depot, it will be recalled, was built as part of the expansion programme of 1944, and in consequence its siting and lay-out were far from ideal. It lay on the edge of the Base area with its full length on one side facing the open country. To make matters worse, this area was about the only one in the whole Base which provided any cover in the form of scrub growing close up to the perimeter wire. Moreover, the perimeter itself enclosed insufficient space to accommodate the large number of vehicles held without the necessity of parking the outer lines within 20 to 30 feet of the wire.

It thus became a matter of comparative simplicity for the would-be thief amongst the employed labour to detach vehicle parts during the day and throw them over the wire, where he or his accomplice would collect them at night. By this means vehicles were not infrequently denuded of all their wheels.

Remedial measures taken included the provision of perimeter searchlights and the clearance of scrub, so far as resources permitted ; but the real fault lay in the original lay-out of the depot as regards location and area allotted. In the writer's experience, vehicle parts and spares are amongst the most valuable and disposable stores in the black markets of the World and their security calls for special attention. Ideally, a vehicle depot should be laid out on the lines of a prisoner of war camp with double perimeter fences, perimeter lighting and guard towers. Above all, adequate room must be provided so that lines of vehicles are not parked too close together. Finally, one trained police dog is worth a dozen sentries.

Welfare

Throughout the War the leading citizens of Madras, both British and Indian, laid themselves out to provide a generous scale of amenities for the entertainment and recreation of the troops stationed in and around the city. Owing to its distance from Madras and the shortage of transport, troops stationed in Avadi were only able to take infrequent advantage of these facilities. Every effort was, therefore, made to provide the Base with its own amenities on the most generous scale possible. A policy of self-help was initiated by the Sub-Area Commander and vigorously pursued by all units ; the object being to provide amenities on a station as opposed

to a unit basis. The outcome of this policy resulted in a large number of sports grounds, a golf course, a boating club, an open air boxing arena seating 2,000, a weekly newspaper, and two village " pubs," modelled on the Tudor and Cotswold styles of architecture respectively and complete in every detail. The success of the latter were assured from the day their doors opened and their fame spread to England, where it attracted notice in the press.

Following the outcry in Parliament in 1944, regarding the welfare of British troops in India, public funds were allotted for the provision of welfare purposes and a definite scale of amenity buildings was laid down for camps. An appeal to The Governor of Madras War Purposes Fund met with an immediate and munificent response. With these joint funds, work was started on two recreation centres. Each centre comprised a swimming pool, cinema, theatre, and canteens for British and Indian troops, all generously equipped and laid out with lawns and flower-beds. Finally, an enterprising unit built a dog-racing track complete with electric hare and totalizator. Unfortunately this was not a success owing to the lack of public spirit and any sense of discipline amongst the ill-assorted four-legged contestants!

It may appear to some that the emphasis laid on, and the efforts put into, welfare at such stations as Avadi during the late War were overdone and, indeed, even harmful in that they tended to shift responsibility from the shoulders of commanding officers. The writer disagrees with this view. Primarily, the responsibility for the welfare of his men, both in peace and in war, rests on the C.O. No amount of organized welfare can compensate for the deficiencies of a weak C.O. But with a National Service Army, and with units located overseas and outside the fighting area, the problem of occupying the men's leisure hours in war-time camps is one towards the solution of which the best C.Os. gladly welcome assistance from outside their units. It is only by taking full advantage of central amenities, such as swimming baths, boxing arenas, sports grounds, cinemas, etc., that they can keep their units happy and contented.

Avadi was fortunate in having not only some very good C.Os., led by a first-class Sub-area Commander, but also a full range of amenities. The proof of the pudding lies in the eating, and the unsolicited verdict of a group of R.A.F. n.c.os. that "Avadi is the happiest station we have been in in the East " speaks for itself.

Conclusions

The methods of military administration will vary in the future, as they have invariably done in the past. But the basic principles will remain. In any future war the need for large base installations will arise again. Their lay-out will be different, since protection against attack by air and long-range projectile will become of primary importance. But the principles involved in planning, transport, labour, water supply, maintenance of morale, etc., will arise again. The main lessons learnt at Avadi will be of use in the future. They are :—

(1) In planning for stores, etc., it is fatally easy to under-estimate requirements in terms of tonnage and cubic capacity. Plan for the maximum, and in the lay-out of depots allow room for at least 100 per cent. expansion, in case it is needed at a later stage.

(2) For the construction of a G.H.Q. installation, stick to the normal chain of command. G.H.Q. should decide what is required and then leave it to the local commander to carry out the work. If, as will normally be the case, the

latter requires assistance, then his staff, both administrative and technical, should be reinforced accordingly.

(3) Construction of buildings should not commence until the roads and railways designed to serve them are built. This is an elementary principle but in war it is easy to disobey it in the (false) interests of speed of construction.

(4) To attempt to use a depot, even for storage purposes, before it is completed will lead to confusion and an overall waste of time.

(5) Ample water supply is essential in a tropical climate. For war-time camps, etc., the minimum requirement is 50 gallons per head per day, with double that figure for hospitals. These figures are based on the assumption that latrines are of the " through flush " type.

(6) Tented hospitals in a tropical climate are a false economy and should be avoided wherever possible.

(7) To make the most economical use of civil labour and transport, it may be found best to organize them on semi-military lines and provide accommodation, clothing, and rations.

(8) Time and energy spent on welfare, if wisely applied, are never wasted.

In conclusion the writer recalls the remarks of a very distinguished " Sapper " on his first visit to Avadi. " It is a curious thing," he said, " that although we built very similar installations in the 1914–18 War, no records appear to have been kept of them. We have had to start from scratch all over again in this war." It is with these words in mind that this article has been written.

THE PLACE OF REGIMENTAL ASSOCIATIONS IN THE PRESENT BRIGADE GROUP ORGANIZATION

By "NOLL"

ALL infantry Regiments have, in some form or another, Associations for ex-officers and men to which all can belong by paying a small annual or "life" subscription. These Associations are normally run centrally through the headquarters of the Regiment, and some, at any rate, have branches in the main towns of the County to which the Regiment belongs.

The objects of such Associations can be broadly defined as follows :—

(*a*) To enable ex-members of the Regiment to keep in touch with each other and the Regiment.

(*b*) To assist men to find employment on leaving the Service.

(*c*) To assist those who are sick or in need.

(*d*) To foster *esprit de corps*.

Up to the beginning of the 1939–45 War, though some officers got accelerated promotion to other Regiments and some other ranks found their way into other arms, a man normally stayed with his Regiment during the whole of his service. The problem of getting him to join his Regimental Association at the end of it was a simple one and depended on the efficiency of the organization within the Regiment. During the War large numbers of men from other units had, of necessity, to be drafted to units to replace casualties, and this failure of the pre-war system to supply sufficient reinforcements was one of the main reasons for the introduction of the Group System in 1948. It is not the purpose of this article to argue the pros and cons of this change, it is assumed that it has come to stay.

PRESENT SITUATION

Since the War there seems to have been a sharp falling off in men joining some of the Regimental Associations. This is probably due to a variety of reasons, of which four are war-weariness, the Group System, National Service, and the lack of an efficient system to meet the new circumstances.

After a war there is a natural tendency for many men who have only served in a Regiment during that war to "get shot of it all," and this cannot be avoided. It can be mitigated, however, by the Service battalions themselves who, quite apart from any Regimental Association, have their own reunions, or which foregather as a unit at some formation reunions, such as 7th Armoured Division.

There is another reason which has not been mentioned above but which, it is believed, may be bigger than one imagines. Some branches of the Regimental Associations consist mainly of "long service" men. If one attends a meeting, the majority are not young men (i.e., in the 20–30 year old class). This may have the effect of frightening young men away because of the "serjeant-major" atmosphere. This is a matter which must be overcome if young men are to join these Associations in the future.

THE GROUP SYSTEM AND NATIONAL SERVICE

From a regimental point of view, the Group System has made it much harder to get men to join a Regimental Association. This is not necessarily due to the two causes already mentioned, but to the "lack of continuity" in a man's service. The reduction in the numbers of infantry battalions of the Line has led to men moving

from unit to unit and there is no certainty to-day that a man who enlists in his County Regiment will spend all his time with it.

A further complication is the advent of the National Service soldier who only serves a short time with the Regular Army and spends the bulk of his service in a Territorial unit, which may not be part of the Regiment to which he was badged in the first place. Indeed, many National Service men join a County Territorial battalion from other arms, such as R.E.M.E.

There are a number of categories of men to compete with, but they can all be reduced to their three main classes, the Regular soldier, the National Service man, and the Territorial Army volunteer.

The Regular soldier is often forgotten. He is, as always, the backbone of any unit or association, and every effort must be made to get him. Provided that he ends his time with his own unit, or is discharged from the Brigade or Regimental Depot, there is not much problem in getting him to join an Association. If he does not end his time in his parent Regiment, but in some other Regiment in the Brigade, he should be encouraged by the Regiment in which he takes his discharge to join his parent Regiment.

The National Service man presents a different problem and the crux of the matter is as follows :—

A soldier is badged to a Regiment. Although the introduction of Depot training will increase his chance of joining a T.A. battalion of his Regiment, it is quite possible for him to serve with another Regiment of the Brigade and do his Territorial service with yet a third. To what Regimental Association should he belong ? Only when that has been decided can a system be devised. It is useless to say " Once a Loamshire always a Loamshire." If his Territorial unit is a good one it will not be long before he becomes part of it. Indeed, it is for the good of the Army as a whole that he should, because he will serve with that Regiment at the outbreak of a war. If this is accepted, then so should its corollary, namely that only National Service soldiers who come to the Regiment's Territorial battalion should become members of the Regimental Association.

There are some men who volunteer for the Territorial Army who have not been with the Regiment before. These men must not be lost sight of.

Solution

There are two possible methods by which the Past and Present Association could be run in the future, either on a Brigade basis, or on a revised Regimental system. In theory there is something to be said for starting a Brigade Association and in the long run it might be a success. Such success would, however, depend on the merging of the Regimental Associations into something bigger. But one of the attractions of the Associations is the " homely " spirit, and a change at this juncture would not be contemplated by the majority of Regiments, though it might be accepted by a special Group, like the Light Infantry Brigade.

Another Brigade system is for the soldier to pay his subscription to a fund organized centrally, and for such funds to be disbursed to Regiments. This would be difficult to organize because one is then faced with the problem as to whether subscriptions should be passed on to Regimental Associations for each individual, or by sub-division of total takings by the number of units in the Brigade. The former

would be almost impossible to achieve, since it would mean following each individual and, moreover, it would not catch the Regular. The latter might work, but is not a satisfactory method and might mitigate against individual units. Finally, now that primary training is to be carried out at Depots, the system would be even harder to work satisfactorily.

The alternative is to bring the present Regimental system up to date. In the past, the two Regular battalions were mainly responsible for ensuring that men joined the Regimental Association. To-day, every unit in the Regiment has a responsibility and clear instructions should be issued by the Regimental headquarters to ensure that no one slips through the net.

There are four places where action should be taken :—

(*a*) *The Regular Battalion :—*

There must be some efficient organization within the battalion to ensure that all Regular soldiers keep in touch with the unit and join the Association at the end of their service. In addition, during the last six months of the National Service man's service, company and platoon commanders should know where he is going to serve his T.A. service. If he is going to the County unit, he should join the Association before leaving.

(*b*) *The Regimental Depot :—*

This unit has the same responsibility as the Regular battalion with regard to Regular soldiers. As regards the National Service man, in some circumstances men are discharged from there. There must be a proper organization to recruit these men into the Association.

(*c*) *The Territorial Battalion :—*

This unit will get men from the Regular battalion who may, or may not, have joined the Association. It will also get men from other units, and the T.A. volunteer. There must be an efficient organization to get these men into the Association eventually.

(*d*) *Regimental Headquarters :—*

This, though placed last, is really the nerve centre of the Association. The Colonel of the Regiment, the Chairman of the Association, and the Administrative Officer must ensure that proper instructions are issued to all unit commanders on the subject. The headquarters is responsible for the adequate supply of badges, regimental ties, allocation of space to the Association in the Gazette, liaison if necessary with the County newspapers, and the annual reunion. The tempo must come from headquarters.

The object should be to get the Regular soldier to some branch near his home, and this is not always easy. If the man lives outside his County, then the headquarters of the Regiment should be responsible for keeping him in touch. There is much to be said for a Headquarters Past and Present branch which takes care of all those who live in other parts of the British Isles. With regard to the National Service man, while he is an active member of the unit there is no need for him to belong to any branch, though if his home or his Drill Hall is near one, it is better that he should. This is a matter for local decision.

It is in the interests of individual Regiments that all battalions of the Brigade should co-operate to encourage Regular other ranks discharged from them to join

the Association of their parent Regiments. Machinery to this end should be set up by the Brigade Colonel.

Conclusion

The changed conditions in the Army have made the working of the Regimental Associations more difficult. Nevertheless, as long as a Regimental system exists, so must its Association, which reflects the tradition of the Regiment and its County. Every unit in a Regiment must ensure that all their men are told about Regimental Associations during their Regular service so that they may join one when they leave, irrespective of whether it is that particular Regiment's or not. Men then join the Association to which they are best suited, and full particulars of all Associations in the Brigade should be kept in each Regiment. If each Regiment does this, all will benefit. The solution is not to change the method, but to bring it up to date.

DIARY OF THE WAR IN KOREA[1]

16th April.—United Nations forces continued to make limited advances, generally against only slight resistance; though in the Hwachon reservoir area and in the approaches to Chorwon they encountered stubborn opposition. In an encounter between U.S. Sabre jet and MIG fighters, one enemy aircraft was reported to have been shot down and two damaged, without loss of U.S. aircraft.

17th April.—United Nations troops maintained their pressure on the West-central and West sectors. Enemy resistance in the Hwachon area diminished.

18th April.—Hwachon and Hwachon reservoir dam were captured and further progress was made South of Chorwon. In the West, patrols moving North of Munsan met with little resistance.

19th April.—United Nations troops occupied the last ridge South of Chorwon. Carrier based aircraft attacked vital targets in North Korea, especially in the Hamhung area.

Warships continued their bombardment of enemy installations at Wonsan and Songjin.

20th April.—Further limited progress was made in the Hwachon and Chorwon areas despite resistance and a small but determined counter-attack by an enemy rearguard. Further limited gains were made in central Korea.

21st April.—Centurion tanks of the British 29th Brigade crossed the Imjin river in West Korea and, carrying infantry, pushed steadily North. Reports continued of a steady build up of the enemy Air Force beyond the Korean frontier.

22nd April.—In an air battle over the Sinuiju area four enemy aircraft were shot down and four damaged by U.S. F-86 Sabre jets.

23rd April.—Chinese and North Koreans opened an offensive during the night of 22nd/23rd along a 100-mile front between Inje and a point 30 miles North of Seoul. Allied troops were forced to withdraw slightly in the Inje area and in the West the enemy forced a crossing of the Imjin river on a 15-mile front. Allied withdrawals took place in good order in both areas, and the enemy suffered heavy casualties.

24th April.—The enemy overran Inje and, in the centre, drove a wedge into the Allied line to the West of Chunchon and near Kapyong, 12 miles South of the 38th parallel. Allied troops in the Hwachon reservoir area held their ground, but, being outflanked, had to abandon Hwachon itself. Enemy casualties were again very heavy.

25th April.—Allied troops recaptured Inje and counter-attacked South-West of Hwachon. In the West the enemy, exploiting their crossing of the Imjin river, advanced to within 25 miles of Seoul. Fighter and bomber aircraft maintained heavy attacks on enemy troops throughout the day.

26th April.—In the central sector, Allied forces made slight withdrawals East of Hwachon, though they beat back enemy attacks on both sides of Hwachon reservoir; they also withdrew slightly North of Kapyong. In the West, the enemy advanced to within 15 miles of Uijongbu and through Munsan to within 20 miles of Seoul. The British Commonwealth 27th and the British 29th Brigades were prominent in actions West of Hwachon and near the Imjin river.

27th April.—United Nations forces in the Hwachon reservoir area withdrew seven miles to avoid being outflanked from the East, but West of this area the main Chunchon-Seoul road remained in their hands. North of Seoul, enemy pressure necessitated a withdrawal from Uijongbu.

28th and 29th April.—In central Korea, United Nations troops withdrew to the South of the Chunchon-Seoul road. In the West the enemy occupied Uijongbu and their forward

[1] A sketch-map of Korea faces page 480.

elements were reported to be within four miles of Seoul. Bad weather reduced to 29 the number of sorties flown by United Nations aircraft.

30th April.—Allied troops withdrew slightly in face of an enemy attack East-South-East of Inje. Contact was scattered in the central sector. In the West, a record number of enemy lorries was seen by Allied aircraft on the roads, and these were bombed and attacked in the light of flares. The enemy landed on Kimpo peninsula, North-West of Seoul, being attacked from the air en route and shelled from the sea on arrival. United Nations tank and infantry patrols were active North of Seoul but met with only moderate resistance. The enemy was shelled by artillery and from the sea throughout the day and was attacked by several hundred aircraft with bombs and rockets.

1st May.—The enemy closed the sluice gates of the Hwachon reservoir to reduce the flow and make fordable the Pukhan and Han rivers. Later these gates were successfully bombed by Allied aircraft, thereby releasing the flow.

The formation of the 1st (Commonwealth) Division, United Nations Forces (consisting of the 28th and 29th United Kingdom Infantry Brigades, the 25th Canadian Infantry Brigade, the 3rd Battalion, Royal Australian Regiment, the 16th Field Regiment, Royal New Zealand Artillery and the 60th Indian Field Ambulance) was announced.

2nd May.—Enemy activity decreased in all sectors, but there were indications of movement from the West to the central area.

3rd May.—Allied troops engaged parties of the enemy South of Chunchon. Between Chunchon and the West, patrols failed to contact any great number of enemy troops except to the East-North-East of Seoul, where 200 were killed and 21 captured. Aircraft flew nearly 1,000 sorties attacking enemy reinforcements and convoys.

The first troopship of those carrying the 25th Canadian Infantry Brigade to Korea arrived at a South Korean port.

4th May.—The lull in the fighting continued. United Nations patrols made little or no contact with the enemy, and a strong tank force raided Uijongbu.

5th May.—In the East central sector, United Nations patrols advanced almost to the 38th parallel, and, in the West, Uijongbu was found to be empty of the enemy.

6th May.—United Nations tank and infantry patrols continued to probe into enemy territory. Chunchon was entered by one patrol, but resistance was met North-West of Uijongbu and North-West of Seoul.

An Ethiopian contingent landed at Pusan.

7th May.—In the East, a probing attack by United Nations troops crossed the 38th parallel South-West of Inje. In the West, part of the Eighth Army main force advanced an unstated distance North-West of Seoul.

8th May.—East of Inje, South Korean troops encountered an enemy battalion. A United Nations armoured column entered Chunchon for the second day in succession. In the West, Allied troops advanced North of Uijongbu and to the Han river 17 miles North-West of Seoul, and contact with the enemy was made on the Kimpo peninsula.

9th May.—The enemy were reported to have fallen back all along the front over which they recently attacked. More than 300 United Nations bombers attacked an enemy air base at Sinuiju in North-West Korea, where a concentration of camouflaged enemy aircraft had been seen.

Lieut.-General Mathew B. Ridgway, the Supreme Commander in Korea, was promoted to the rank of General.

10th May.—Inje and Chunchon were entered by United Nations patrols. Strong patrols routed a force of 6,000 North Koreans West of the Seoul-Munsan road and subsequently entered Munsan.

11th May.—United Nations troops gained three miles in the Eastern sector in an advance North of the 38th parallel. A patrol entering Chunchon in the central sector encountered resistance. In the West, the enemy were reported to be building up concentrations on an arc some 20 miles North and North-East of Seoul.

12th and 13th May.—Enemy resistance stiffened along the whole front and counter-attacks up to regimental strength were reported. Enemy troop concentrations were observed in four places North of the 38th parallel, including the extreme Eastern area; the heaviest being North of Chunchon and North-West of Seoul.

14th May.—In the East, South Koreans were forced to withdraw South of the road from Kansong to Inje. Some ground was gained by Chinese North-East of Chunchon, and an enemy concentration was reported between Hwachon and Kumhwa. Allied patrols were unable to break through the enemy screen North of Munsan. Allied aircraft carried out continuous attacks on enemy concentration areas and supply routes, while warships shelled similar targets along the East coast route.

15th May.—The enemy made slight advances in the neighbourhood of Inje and South-West of Chunchon. The spring rains, which started on 14th May, slowed down United Nations ground and air activities.

16th May.—The enemy attacked in force in the Eastern sector from the sea to Chunchon and made probing attacks in many other parts of the front at the same time. They captured the road running North-East from Inje to the coast and continued to advance to the South.

17th May.—The enemy continued their attacks along almost the whole of the front. Some slight withdrawals were made by the Allies thereby allowing the Communists to waste their strength in minefields and obstacles and to suffer very heavy losses. Considerable toll of enemy troops was taken by Allied artillery and aircraft while bombers attacked enemy assembly points, transport trains and marshalling yards by day and night.

18th May.—Despite severe losses the enemy were reported to have forced back the Allied forces to an approximate line from a point South of Inje-Chunchon-Kapyong-South of Uijongbu-Munsan. Fighting in the areas Inje-Hongchon-Chunchon, where the enemy were stated to have created a gap in the line, and in the approaches to Seoul, was reported to be very severe.

19th and 20th May.—On the East coast, two South Korean divisions withdrew to new positions under covering fire of warships. In the central sector, the U.S. 2nd Division repulsed enemy attacks North-East of Hongchon. In the other sectors, the Eighth Army held the general line, and patrols were active in the Uijongbu area. Aircraft continued their attacks on enemy concentrations and also shot down three MIG-15s and damaged six others without loss to themselves.

Royal Marines raided the West coast of Korea behind the enemy lines in the Chinnampo area on 20th May and, after destroying military installations, returned safely to their ship.

21st May,—Enemy forces were reported to be withdrawing in several sectors and United Nations troops advanced again towards the 38th parallel. Heavy concentrations of enemy troops were reported in several rear areas, however, and further attacks were considered to be possible.

22nd May.—Renewed enemy attacks in the Eastern sector compelled South Korean forces to fall back to new positions over a stretch of 25 miles, at one point 26 miles South of the 38th parallel, but reinforcements were reported to be moving to their assistance. In the West, United Nations troops advanced to points 25 miles North-East and North-West of Seoul.

23rd May.—The U.S. X Corps counter-attacked in the East-central sector and captured Hangye, thereby threatening to cut off the enemy forces which continued to try and deepen the wedge made in the United Nations flank to the East. Elsewhere the enemy hastened their withdrawal and Allied troops gained five miles on the West-central sector and as much as 15 miles further West. United Nations aircraft flew 567 sorties in support.

24th May,—The Eighth Army took the offensive along the entire front. The heaviest attack was in the centre where the X Corps entered Chunchon and continued the advance

to cross the 38th parallel.

Warships bombarded areas round Wonsan, enemy troops near Yangyang and communications on the East coast.

25th May.—Allied troops set up a road-block near Inje, North of the 38th parallel and astride the enemy's only road of escape from the East-central sector. Resistance was encountered East of the Uijongbu-Seoul road, where enemy rearguards were dug in on mountain ridges.

26th and 27th May.—The capture of Inje and Hwachon by United Nations troops was reported. In the Western sector, patrols reached a point just short of Yonchon. The enemy were reported to be surrendering in larger numbers than heretofore and their retreat was being carried out by day and by night.

28th May.—On the East coast, South Koreans reached a point 14 miles North of the 38th parallel. Advances by Allied troops were also made North of Inje, Hwachon and Yonchon. Patrols which crossed the Imjin river spread out without finding any large numbers of enemy.

29th May.—In the East, South Koreans took Kansong after an advance of 12 miles. Resistance increased in the Hwachon reservoir area and North of Yonchon. A gain of a further five miles was made North-East of Seoul, but North-West of the town opposition was encountered on the railway and road to Pyongyang, North of the Imjin river.

30th May.—United Nations forces cut the road between Kansong and Inje, after advancing across country, and South Koreans moved to meet them from Kansong. Elsewhere resistance increased and mud retarded movement.

31st May.—The enemy counter-attacked in the Inje area and cut the road from there to Hyon. United Nations troops captured the dam of the Hwachon reservoir. An enemy counter-attack South of Chorwon gained some ground which was subsequently retaken, and strong resistance was met East of Yonchon. In the West, South Korean and other troops endeavoured to enlarge the bridgehead North of the Imjin river. Rain and mud continued to hamper movement.

1st June.—United Nations troops seized two key positions in the hills at the Eastern end of the Hwachon reservoir and also advanced over two miles at the Western extremity. Elsewhere attempts to advance were met by stronger resistance. Aircraft flew 565 sorties and destroyed three and damaged two enemy machines for the loss of two fighters.

2nd and 3rd June.—Eighth Army troops gained some ground in most sectors, although impeded by stubborn resistance and mud. In the Inje area, enemy entrenchments North of the town were overrun in an advance of nearly three miles. East of the Hwachon reservoir, patrols probed an enemy defence line, while North-East and North of Hwachon town some progress was made on a two-mile front.

4th June.—Further ground was gained North and North-West of Hwachon and North-East of Yonchon, which was captured after six days' fighting. In the Imjin river area, enemy counter-attacks were broken up.

The battleship "New Jersey" and two destroyers entered Wonsan harbour and shelled troop concentrations and gun emplacements.

5th June.—Considerable resistance was met North and North-West of Hwachon and little or no ground was gained in an endeavour to advance, but some two miles were gained along the Yonchon-Chorwon railway.

6th June.—Further slight gains were made North of Inje, along the Hwachon-Kumhwa road, and towards Chorwon.

7th June.—In the East and East-central sectors, advances were halted by vigorous North Korean resistance. Further West, one height South-West of Kumhwa and another four miles South of Chorwon were captured from the enemy.

8th June.—In the East, little or no progress was made against strong North Korean entrenchments. Further West, advances of one and two miles were made towards Kumhwa and Chorwon respectively, despite the opening of a floodgate of the Chorwon dam. These advances followed the dropping of a hundred tons of fragmentation bombs by United Nations aircraft in the Kumhwa-Chorwon-Pyonggang area.

9th and 10th June.—Infantry and tanks broke into the base of the enemy's stronghold in the triangle Kumhwa-Chorwon-Pyonggang. The retreating enemy abandoned great quantities of supplies and ammunition.

11th June.—Kumhwa and Chorwon were occupied and further advances of over two miles were made. Enemy movement and artillery fire increased in the West, where United Nations patrols were active across the Imjin river near Korangpo and Munsan. United Nations aircraft attacked a railway junction North-East of Pyongyang.

12th June.—Some ground was gained towards Kumsong. Otherwise no reports were received.

13th June.—In the East, South Koreans encountered some resistance North of Kansong. On their left, North Koreans retreated in mountainous country, harried by aircraft, but delaying ground pursuit by stubborn rearguard actions. In the East-centre and centre sectors, the enemy continued to withdraw, abandoning large quantities of ammunition and supplies owing to lack of transport. Aircraft attacked retreating enemy columns, pack trains, and supply routes; Pyonggang was also heavily attacked from the air.

14th June.—United Nations troops passed through Pyonggang in an advance further to the North. Reports stated that the enemy were making a mass withdrawal from the whole of the central sector.

15th June.—In the East-central sector, advances towards Kumsong met resistance, especially on the road from Kumhwa. In the West, there were indications that the enemy main forces had withdrawn a considerable distance.

16th and 17th June.—Reports stated that Chinese reinforcements had arrived in the mountains East of Kumhwa, that Pyonggang had been retaken by the enemy and that Allied troops had to make a fighting withdrawal North-West of Chorwon. Superfortresses bombed enemy air-fields at Pyongyang and Sariwon, and, in an encounter over Sinuiju between 20 Sabre jets and 25 MIG-15s, one enemy aircraft was brought down and six damaged. Lieut.-General Van Fleet stated that a third round of the enemy offensive was expected.

18th June.—Enemy resistance increased at most points across the peninsula. In the East, the North Koreans fought delaying actions North of Inje and, in the centre, the enemy continued to move back into the triangle Kumhwa-Chorwon-Pyonggang. In the West, however, an Allied task force across the Imjin river failed to contact the main body of the enemy. Five enemy MIGs were destroyed and two damaged by U.S. aircraft.

19th June.—In the East, a gain of two miles and the capture of a ridge from North Koreans resulted from an all day fight. Four enemy MIG fighters were damaged in an encounter with U.S. Sabre jets.

Millions of leaflets were dropped on enemy troops emphasizing their heavy casualties and the futility of this exorbitant sacrifice of life.

A battalion of volunteers from Colombia landed in Korea.

It was reported that units of the 29th Brigade Group would be relieved individually later in the year and that soldiers not belonging to such units would not be called upon to serve in Korea for more than 18 months.

20th June.—West of Kansong, United Nations forces gained ground towards the main road to the East coast. East of Kumhwa, the enemy withdrew after a 24 hour

fight. In an encounter 35 miles South of the Manchurian border, in which over 100 aircraft took part, six enemy propeller-driven fighters and four MIG-15 jets were destroyed or damaged.

21st June.—No reports were received regarding the Eastern sector. Elsewhere the front was quiet except for minor clashes in the centre and West. It was reported that three Allied aircraft were lost in fights during the last four days.

22nd June.—Apart from minor clashes in the Eastern sector and patrol activity the front was quiet. Five enemy MIG-15 jets were destroyed or damaged.

23rd and 24th June.—Heavy fighting was reported for ridges commanding approaches to Kumsong. After more than a day's fighting United Nations troops withdrew from two ridges South of Pyonggang. In the West, a strong Allied force advancing North-West of Chorwon was attacked on three sides by the enemy and had to fight its way out. Four enemy MIGs were damaged and one U.S. Shooting Star was shot down by ground fire.

25th June.—In the East, enemy counter-measures forced back Allied patrols North-East of Inje. Fighting for the ridges South-West of Kumsong continued. Unsuccessful endeavours were made by United Nations patrols to drive the enemy off a hill over-looking the Seoul-Wonsan railway and road 30 miles North of Seoul.

26th June.—Fighting occurred in some sectors but no important gains were made by either side, except near Kumsong where United Nations troops gained four miles. Air reports stated that the enemy was increasing his efforts to move supplies and reinforcements to the front. United Nations aircraft attacked supply lines and destroyed or damaged many vehicles; they also bombed the railway junction at Sinanju.

27th June.—The enemy withdrew some supplies in the Kumsong area as a result of the advance by Allied troops on 26th. Elsewhere Allied patrols met stout resistance, especially in approaches to areas near Inje, Pyonggang and Yonchon, where the enemy were reported to be concentrating troops and supplies.

28th June.—Enemy attacks between Kumhwa and Chorwon were broken up by artillery fire. North-West of Chorwon an Allied reconnaissance in force made a deep penetration through minefields and against slight resistance.

During the continued bombardment of Wonsan area from the sea, enemy shore batteries got the range of the U.S. battleship "New Jersey," but were silenced before they could score a hit.

29th June.—Under instructions from Washington, General Ridgway, sent a message to the enemy commander stating that it was understood that the latter might wish a meeting to discuss an armistice providing for the cessation of hostilities and, if this was the case, suggesting a Danish hospital ship in Wonsan harbour as the meeting place.

Apart from small probing actions in the central sector and some sharp fighting North-West of Yonchon there was little activity along the front.

30th June and 1st July.—On 1st July, Peking broadcast a message from the North Korean and Chinese commanders, addressed to General Ridgway, stating that they were authorized to agree to a meeting of representatives for conducting talks concerning the cessation of military action and the establishment of peace. They proposed that the meeting should be in the Kaesong area and that it should take place between 10th and 15th July.

The front continued to be comparatively quiet apart from aggressive patrol activity by United Nations troops. There was, however, no abatement of air attacks; Superfortresses dropped 1,150 bombs on airfields in West Korea, while Thunderjet, Mustang, and Shooting Star aircraft bombed and attacked Sariwon airfield and areas in central Korea.

2nd July.—Heavy attacks were made by fighters and bombers on enemy airfields, troop concentrations, and supply centres.

Warships bombarded various points on the East coast of North Korea.

3rd July.—General Ridgway, in a broadcast message, informed the enemy commanders that a meeting at Kaesong on 10th July was agreed to. He proposed a preliminary meeting of liaison officers on 4th July to ensure efficient arrangement of details.

In central Korea, United Nations troops captured the highest peak of a ridge South of Pyonggang after prolonged fighting. Allied aircraft bombed an airfield at Pyongyang and attacked the railway and marshalling yards South and South-West of that town, destroying or damaging much rolling stock.

4th and 5th July.—Peking broadcast a message on 4th July agreeing that a preliminary meeting of liaison officers should take place at Kaesong, but proposed that this meeting should be fixed for 8th July. General Ridgway replied on 5th July agreeing to this date and asked for positive assurance of safe conduct for his officers.

On the East coast, a South Korean patrol advanced to a point 40 miles above the 38th parallel. Enemy attacks South and South-East of Pyonggang were repulsed. Allied aircraft flew a number of sorties in observation of enemy troop movements.

6th and 7th July.—In reply to a message from Peking, General Ridgway agreed that the convoy carrying the enemy representatives to Kaesong would be immune from attack; he added that an area within a five-mile radius from the centre of Kaesong would be observed as a neutral zone from the time of arrival of the enemy delegates. He also informed the enemy commander that his delegates would cross the Imjin river on the Seoul-Kaesong road at 9 a.m. on 8th July, by helicopter or jeep as dictated by the weather, and requested safe conduct. The enemy commander agreed.

Patrol activity continued, especially on the central front. United Nations aircraft were also active.

8th July.—Arrangements for the negotiations due to commence at Kaesong on 10th July were made at the preliminary meeting there between United Nations and enemy representatives. This meeting, which lasted for four hours, was officially described as harmonious and without incident.

It was announced that the names of the United Nations officers who would be present at the negotiations on 10th July were Vice-Admiral C. T. Joy, Commander Far East Naval Forces; Major-General L. C. Craigie, Deputy-Commander, Far East Air Forces; Major-General H. I. Hodes, Deputy Chief of Staff, Eighth Army; Rear-Admiral Arleigh Burke, Commander, Cruiser Division in Korean Waters; and Major-General Paik Sun-yup, South Korean Army.

Three MIG-15s were shot down and one was damaged, North of Pyongyang, by U.S. Sabre jets which went to the aid of Mustang aircraft which were attacked after bombing an airfield in North Korea.

9th July.—In the East-central sector, bitter but inconclusive fighting took place for high ground held by the enemy North-East of Yanggu. Elsewhere the front was comparatively quiet. Allied aircraft were active bombing enemy airfields and a marshalling yard. One enemy MIG was shot down in the North-West.

10th July.—Four helicopters left Munsan about 9.30 a.m. carrying the United Nations Military representatives to the meeting at Kaesong. After first talks lasting four hours they returned to Munsan.

There was little fighting by ground forces during the day. Rain and poor visibility reduced the number of sorties flown by United Nations aircraft to 22, but air observers reported seeing supply trains moving into North Korea from Manchuria.

11th July.—The second meeting of military representatives took place at Kaesong and adjourned after six hours.

CHINA
MANCHURIA
CHONGJIN
HYESANJIN
SONGJIN
TANGCHON
IWON
CHOSAN
KANGGYE
CHANGJIN
CHANGJIN RESERVOIR
HAGARU
HAKALWOO
KOTORI
YALU R.
SINUIJU
UNSAN
CHONGCHON R.
HUICHON
HAMHUNG
SINPO
HUNGNAM
TOKCHON
TAEDONG R.
PAKCHON
KUNU
ANJU
CHONGJU
SINANJU
YONGHUNG
JUNAN
WONSAN
PYONGYANG
TONGCHON
CHANGJON
CHINNAMPO
SUAN
KOKSAN
IMJIN R.
KOSONG
SARIWON
PYONGGANG
KUMSONG
KANSONG
YESONG R.
GHANGYON
NANCHONJON
KUMHWA
CHORWON
SONGHYON
KUMCHON
YONCHON
HWAGHON
YANGGU
INJE
YANGYANG
HAEJU
KAESONG
38°N
KOREA
MUNSAN
KAPYONG
CHUNCHON
CHANGYE
KANGNUNG
UIJONGBU
HONGCHON
KIMPO
SEOUL
YONGDU
CHONGSON
SAMCHOK
YONGDUNGPO
INCHON
ANYANG
CHIPYONG
HOENGSONG
PYONGCHANG
SUWON
WONJU
TOKCHOK ISLAND
ICHON
YOJU
CHECHON
YONGWOL
KUMYANGJANG
HAN R.
OSAN
PYONGTAEK
ANSONG
CHUNGJU
TANYANG
CHONAN
YONGJU
YECHON
CHONUI
CHOCHIWON
CHONGJU
ANDONG
HAMCHANG
YONGDOK
KONGJU
POUN
SANGJU
UISONG
TAEJON
YONGDONG
SONSAN
CHANGSA
KUM R.
NONSAN
NAKTONG R.
UINUNG
KIAYE
HUNGHAE
KANGGYONG
KUMCHON
YONGCHON
ANGANG
PONANG
WAEGWAN
KUNSAN
SONGJU
TAEGU
KYONGJU
CHONJU
KYONGPUNG
IMSIL
HYOPCHON
CHANGNYONG
NAMWON
TANYANG
HAN R.
CHINJU
MASAN
PUSAN
KWANGJU
HADONG
HAMAN
SUNCHON
MOKPO
YOSU
SCALE OF MILES
20 10 0 20 40 60

United Nations troops advanced half a mile North-East of Yanggu and took important high ground. Some small enemy attacks near Pyonggang were repulsed. Superfortresses bombed railway yards. Three MIG-15s were shot down and another was damaged in air actions South of the Yalu river.

12th July.—The negotiations at Kaesong were halted after a group of 20 United Nations reporters and photographers were barred at a North Korean post from entering Kaesong. When the enemy High Command supported this action Vice-Admiral Joy sent word to General Nam Il, the chief enemy delegate, that there would be no more negotiations until this prohibition was removed. The enemy reply stated that no news reporters from either side should be allowed into the meeting area until both sides had agreed. General Ridgway sent a message to the enemy commanders saying that cease-fire negotiations would be resumed only when the United Nations delegation had unrestricted movement in an absolutely neutral zone, free of armed guards, at Kaesong or elsewhere.

13th July.—As no reply to General Ridgway's message had been received there was no meeting of the military negotiators.

14th July.—The enemy commanders, in a message broadcast by Pyongyang radio, accepted General Ridgway's conditions for re-opening negotiations at Kaesong, including a neutral zone within a five miles radius therefrom and the attendance of 20 news reporters within the area.

15th July.—The armistice negotiations were resumed at Kaesong. Twenty news correspondents were included in the United Nations party.

There was no fighting of moment anywhere on the Korean front.

Medals for Service in Korea

The Committee on the Grant of Honours, Decorations, and Medals announced on 25th July that The King has approved the institution of a medal for British Commonwealth Forces who have served in Korea.

The Headquarters of the United Nations in New York announced on 28th July that a medal had been instituted for award to United Nations sailors, soldiers, and airmen who have served in Korea.

THE INTERNATIONAL SITUATION[1]

By A. K. CHESTERTON, M.C.

TOWARDS A JAPANESE PEACE TREATY

THE preparation of the draft Japanese peace treaty was an obvious step towards the establishment by the West of a long-term Far Eastern policy. Had it not been for the unbalance of forces, accentuated as it was by the American withdrawal from Korea, the Communists might well have hesitated to cross the Thirty-Eighth Parallel. Even a Japanese army of modest size, supported by American air and naval power, would have been a strong deterrent. That the drafters of the proposed treaty recognize this fact is shown by their willingness to restore to the Japanese Government sovereignty over its future armed forces. The uneasiness caused by the intention to repose trust in our late Eastern enemies, especially among our kinsmen in Australasia, is readily understood. Charming as the Japanese people in peace-time appeared to many Western observers, the revelation of what lay so close beneath that delightful exterior appalled all who were later brought within reach of its menace. Realities, nevertheless, must be faced. Ironical as it may seem, a strong Japan would now be less a danger to civilization than would a weak Japan.

The conditions which permitted Japanese aggression during the 'thirties and 'forties no longer exist, and could only be re-created, in an analagous form, were Japan to enter the Communist camp. Denial of sovereignty would be much more likely to lead to that disastrous event than would be the granting of it, subject to safeguards which avoided an affront to national pride.

At the beginning of the occupation, efforts were made to weaken the Emperor cult, although the Emperor's authority had facilitated the surrender and saved much useless shedding of blood. It would be a pity were the same iconoclastic impulse to be further encouraged, because the Emperor mystique is a bulwark capable of saving the Japanese from the Communist tide. There remains to be noted the fact that the peace treaty, if and when it is signed, in effect will bring into being an American-Japanese Alliance. That, too, is inherent in the logic of the present situation, however sardonic may be the thoughts of Britons who recollect the Anglo-Japanese Alliance, and ask themselves if history might perhaps have taken a happier course had the treaty been renewed, instead of being dropped in response to transatlantic pressure.

KOREAN HOPES AND SNARES

The representatives of General Ridgway at the Korean cease-fire talks, being honest soldiers trained in forthrightness, were completely unprepared for the propaganda trap laid for them by the tortuous mind of the enemy. Their arrival for the conference was stage-managed to give the impression, duly recorded by a battery of camera-men, of a delegation sent by the vanquished to sue for peace, and the arbitary interference with the transport of their entourage was intended as a further demonstration of Chinese power and authority. It is improbable that the West will again be taken unawares by such cunning. More important was the fact that the talks took place at Kaesong, and not, as at one time seemed possible, somewhere in the vicinity of Pusan. The Communist aggressors have not been given —as some too optimistic Western commentators were quick to boast—a terrific punch

[1] As deduced from reports up to 20th July.

powerful enough to destroy their armies, but their major offensive was held and they have been pressed steadily back, with a loss of life heavy enough not to require the exaggeration which has now become habitual. There can be no doubt that the Chinese and North Koreans are feeling sore all over, for they have taken heavy punishment, especially from the air, but they are still the wielders of a coherent power that is very far from being overthrown.

Why, then, were the services of M. Malik invoked on their behalf? There are probably several reasons, of which by no means the least important is the fact that the war of man-power against machine-power was not yielding its expected results and suggested that the famous Clausewitz principle might be employed, as it were, in reverse. There is no evidence that the Communist objectives have changed. When the impending cease-fire talks were made known by Peking radio, particular care was taken to emphasize that the "liberation" of Formosa had top priority and would on no account be abandoned. Aware that the Western Powers were anxious for a settlement—they had frequently proclaimed this to be their desire—Mao Tse-tung, after consultation with Moscow, may have decided to seek the fulfilment of his main strategy at the conference table. If the West wanted peace very badly, he perhaps argued, it might be brought to the point of surrendering Formosa in exchange for it. Although his bargaining power was not as strong at Kaesong as it would have been near Pusan, the manœuvre must have seemed to him well worth a trial. At the worst it would give his troops a rest from bombs. That is why, should negotiations begin, they will prove for the West, as tough as any similar tussle with the Russians. The West will enter the conference room seeking a satisfactory settlement. The East will enter it seeking Formosa and—at one remove—the whole of Korea. It would be foolish, therefore, to entertain extravagant hopes, at any rate as long as there are undefeated enemy armies in the field.

RUSSIAN STRENGTH AND WEAKNESS

The Under-Secretary of State for War has furnished figures of the Soviet Union's armed strength, which show an increase of about fifty divisions since the Prime Minister spoke of the one hundred and seventy odd divisions at the Kremlin's command. This fact should cause no surprise. The West having embarked upon a prodigious effort to match the war-preparedness of the East, it would indeed be astonishing were the East not to exert itself to maintain its lead in man-power. Nothing could be more absurd than to underestimate the importance of man-power, and thereby lightly dismiss the reality of the Russian menace, but it does happen to be the fact that man-power is only one factor in the general situation. Man-power in this context is equated with quantity. Quality has also to be considered. Such was the prowess of the Red Army in the later stages of the War that most people forget its showing against the Finns, and neglect the fact that only when the keen edge had been taken off the German attack by the Russian Winter and the desolation of the Russian landscape, as well as by an heroic minority of Russian troops, did Russian units as a whole develop an aggressive fighting spirit. Had Hitler not committed the Napoleonic blunder of sending his armies into a terrain that had (as he later virtually confessed) a fatal psychological effect upon every single man; had he, instead, kept them not far beyond their accustomed pale, with their front not hopelessly extended and their lines of communication not of impossible length, it is certain that the Red Army would not as easily have created its own legend.

The relevance of these speculations to the present day—or, at any rate, to some

conceivable future—is that the possession by Russia of two hundred divisions, or even of four hundred divisions, while constituting an appalling threat, does not betoken the existence of an invincible army. If the divisions were launched across the Elbe to meet with instantaneous success, they would constitute a desperate problem for the countries they over-ran, and, after that, no small problem for the Kremlin. If, on the other hand, they were badly discouraged at the start (and the means of discouragement are not lacking) they would almost certainly turn back in a frantic stampede and the Kremlin would then have the exclusive and unenviable problem of coping with them. Stalin is a realist. It is exceedingly improbable that he would ever expose himself and his regime to so gruelling a test. This, of course, is no plea for Western complacency, but rather for Western preparedness to deliver the discouragement, at full blast, where and when, if ever, it is required.

Liability of the Satellites

The troops of the satellite states, in the event of a serious initial reverse in war, would be an even greater liability to their employers. Some awareness of her weakness *vis-a-vis* the "liberated" countries was demonstrated by Russia when she placed one of her Army Marshals in supreme command of the Polish forces. It is believed that her military attaches in Bulgaria, Rumania and Hungary, while holding no such official appointment, are the *de facto* commanders of armies there amounting—according to M. Dedijer of the Yugoslav Foreign Policy Committee—to 830,000 men. (In Albania the meetings of the Government itself are said—perhaps not untruthfully—to be held in the Soviet Embassy). It is not possible so to indoctrinate hundreds of thousands of soldiers that they become all-weather champions of an alien and far from popular Power. As nothing succeeds like success, they might be reliable while the sun shone, but when disaster came they would very soon reveal how little impression had been made on them by Soviet "ideology." The Russians have to contend in Eastern Europe not only with the still numerous elements which look forward to a time when they can re-affirm their affinities with the West, but even more with convinced Communists—as distinct from sycophants of the Kremlin—who have tended increasingly to repudiate the notion that "Russification" is a proper means of fulfilling their ideals. To these men and women Tito has been the source of great encouragement. Although they are being tracked down, demoted and purged, there is a limit beyond which wholesale liquidation defeats its own ends. There can be no doubt that a jolt would bring down in ruins the whole rickety Soviet Empire in Eastern Europe.

It is probable that Moscow would be able to retain a somewhat longer hold on the minorities absorbed into the Soviet Union, although Letts, Lithuanians and Estonians still keep alive their sense of nationhood, together with a secret hatred for those who carried out the various deportation programmes. Strongest of all resistance movements within the Soviet structure, however, is undoubtedly the Ukrainian, which has caused such alarm in high places that in the eyes of Moscow simple Ukrainian patriotism now ranks with Trotskyism as a major heresy.

GERMANY THE KEY

Stalin and the other members of the Politburo, not having attained their pre-eminent positions by virtue of dreamy dispositions, are well aware of these fundamental weaknesses, which is the best guarantee that they will not lightly launch a third world war. There are already signs that they are anxious to ease the

international tension, not because any objective has been abandoned, but because they are conscious of the need to pursue their objectives by other than military means, although, of course, the military threat will be retained. The chief Soviet objective in Europe is undoubtedly a Communist Germany ; failing that, a Germany kept weak. As the Germans live sufficiently close to Russia not to harbour the delusions which flourish in places further afield, there seems little chance that they will voluntarily submit themselves to a Slavonic despotism. Nevertheless, an impotent Germany, like an impotent Japan, must inevitably detract from Western strength. The *ohne mich* attitude of so many post-war Germans is liable to create in the heart of Europe a spiritual corruption that must further poison the times in which we live.

There is only one way of coping with this danger, and with the extremist reactions which it produces. The Germans must be allowed to regain a sense of national self-respect. Their truly dreadful record may be, in part at least, the result of the psychotic attitude which they have the grim misfortune to create in their neighbours. The vicious circle should not be beyond the power of man to break.

THE PERSIAN OIL PROBLEM

At the time of writing, the Persian problem is further from a solution than it was three months ago. The trouble is that the Western nations do not appear to have approached it with an agreed policy. However, there is no likelihood that Persian oil will ultimately be placed beyond reach of the Western world. The solution that will emerge in the long run—it has already been adumbrated—is almost certain to be the link up of the Persian oil industry within the frame-work of an international consortium, perhaps set up in conjunction with one or other of the Western defence organizations.

CORRESPONDENCE

(Correspondence is invited on subjects which have been dealt with in the JOURNAL *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.)

FLYING BOATS IN WAR

To the Editor of the R.U.S.I. JOURNAL.

SIR,—I notice that on page 242 of the May number of the JOURNAL, in the Discussion which followed the lecture "Flying Boats in War," I am misquoted as having said "'x' might be, say, between five and seven thousand miles," whereas, in fact, I said, "'x' might be, say, between five and seven hundred miles."

C. E. CHILTON,
Air Commodore.

12th June, 1951.

(An error for which we apologize.—EDITOR.)

OBEDIENCE TO LAWFUL COMMAND

SIR,—Further to the recent controversy with regard to the duty a disciplined officer or man owes to the commands given to him by a superior, the following may be of interest.

In an account of the expedition to the Low Countries in 1578, published by Thomas Digges in the year following, the form of oath prescribed for both officer and man is given as follows:—

> "I, ..., do swear and promise to do all loyal, true and faithful service unto the Queen of England, Her Most Excellent Majesty, and unto the provinces and cities united in these countries, and their associates, under the charge of the Right Excellent the Earl of Leicester, Governor-General of the said provinces and cities, and their associates, and of Her Majesty's army and forces within the same; and all *lawful* and due obedience unto the said Governor, and to any other superior that shall have charge under him for government in his army. And further, I do promise to endeavour myself to fulfil and keep all such *lawful* ordinances as His Excellency hath or shall set forth and establish for the better ordering of this army, as much as concerns me, so long as I shall serve in the same under him. So help me God by Jesus Christ."

Inferentially, however, this oath was found to be far too inexact and dangerously elastic; in which one senses the strong, disciplined standards of that sixteenth century John Moore, John Norris. At all events, the form of oath subsequently underwent drastic re-phrasing, as Hawkins's "Statutes at Large" (London, 1735) bear eloquent witness. The italics in the above are, of course, mine.

REGINALD HARGREAVES,
Major.

21st June, 1951.

TERRITORIAL ARMY TRAINING

SIR,—Under your May Correspondence, Lieut.-Colonel C. J. H. Mead writes that "there are many ex-officers living in the West of England, etc., who would eagerly enlist or re-enlist in the Honourable Artillery Company or the Artists Rifles in London but for the question of distance."

After the Boer War I had to live in Bournemouth for some three years. Not wishing to resign from A Battery, H.A.C., I was given permission to train with B.B. Battery, R.H.A., stationed at Christchurch Barracks nearby; and was thus able to keep up my quota of drills; and join my H.A.C. Battery in three annual camps.

Needless to say I had a splendid time with the Regular Gunners, even being allowed to ride with them on their Autumn Manœuvres.

Doubtless it could be managed to-day.

L. J. WICKES,
Captain.

4th July, 1951.

DECISIVE BATTLES

SIR,—In June of this year it was 100 years since Sir Edward Creasy published his work " Fifteen Decisive Battles of the World " ; he begins with Marathon and ends with Waterloo. Following Hallam, he inclines to give first place to Charles Martel's defeat of the Saracens near Tours in A.D. 732—" One of the few battles of which a contrary event would have essentially varied the drama of the world in all its subsequent scenes." How many battles should now be added to Creasy's list ? For myself, I would propose only the Marne in 1914, the Battle of Britain, the defeats of Rommel at Alamein, and the triumphant defeat of the Japanese Fleet at Midway in 1942 by American carrier aircraft. I am not sure if the Russians' victory at Stalingrad falls within Hallam's classification. When " The Hinge of Fate " is published we shall know the judgment on these matters of the most distinguished living military historian. In the meantime it would be interesting to learn the opinions of others of your readers.

R. OGIER WARD.

9th July, 1951.

MAGINOBILITY

SIR,—I was interested to see in the May number, just received, that " F.S.B.", that protagonist of immobility, has again written an article on that subject.

In the November, 1939, number his article " Modern Warfare—Mobile or Missile " he concluded with the remark " Common sense and experience combine to indicate that if the enemy can be attacked by missiles, it is neither necessary nor desirable to close with him, while if he must be attacked with bayonets or other hand weapons—because the attackers' missiles do not reach him—obviously it cannot be done in a vehicle at all."

I wonder if after the German invasion of France, so shortly after his article appeared, he still was of this opinion.

Now he writes " No really satisfactory explanation of the failure of the invulnerable British tanks to sustain the Cambrai (1917) offensive has ever been given." Surely it was obvious that we had not sufficient echelons of tanks and their crews to keep up the pressure.

He does, however, now agree that attack is the best defence, but then tries to prove that armour and the size and weight of the guns will make the tanks immobile or preclude the carrying of sufficient ammunition.

In November, 1939, he maintained that mobility could not be combined with missiles, now his contention is that mobility is impossible when weight of armour and guns are taken into consideration. Poor old Mobility. How do we keep the initiative without it ?

F. S. THACKERAY,

4th June, 1951. *Brigadier-General.*

SIR,—Brigadier-General Thackeray, quoting from my article published in the JOURNAL of November, 1939, asks if I have changed my views since the German invasion of France. The answer is No. The statement he quotes was true when I wrote it, and is true still. Its truth is not affected by anything the Germans did in France or anywhere else.

As to Cambrai. On 20th November, 1917, a force of some 380 tanks, with infantry and artillery, attacked and broke clean through the Hindenburg position, capturing most of its garrison and much of the German artillery. On the next and following days this force, reinforced by three fresh divisions of cavalry, tried to renew the advance. The Germans received no reinforcements for 48 hours, though their losses had been as heavy as ours had been light. Yet we failed. Brigadier-General Thackeray explains this by saying that we needed more tanks to enable us to keep up the pressure. It is possible that with another 500—or 5,000—tanks we might have been able to advance to the Rhine and beyond, but that still does not explain, to me at any rate, why the

300 or so tanks present on the Cambrai battlefield could advance no further than Bourlon Wood. Not all of them had broken down or been knocked out on the first day. All the prepared defences had been passed. The ground was favourable for tank action, having been chosen for that reason. And the Germans at that time had almost no anti-tank weapons.

I have never tried to prove that armour or weight of guns would make tanks immobile, etc. What I said was that armour protection and mobility were mutually exclusive attributes, and that increase in one could only be obtained by the sacrifice of the other. This statement is also true. I might add that, of the two attributes, I personally think that mobility is the more valuable; though I do not think that this was the opinion of the originators of the tank.

Finally I can only answer the two statements in Brigadier-General Thackeray's last paragraph with a categorical denial. He has either misread or misunderstood what I wrote. The assertions in this last paragraph have no more justification than the one in the first that I am a "protagonist of immobility".

"F.S.B."

11th July, 1951.

GENERAL SERVICE NOTES

NORTH ATLANTIC TREATY ORGANIZATION

REORGANIZATION OF THE NORTH ATLANTIC COUNCIL.—Two important changes in the North Atlantic Treaty Organization, aiming at the simplification and centralization of the North Atlantic Council, were announced by Mr. Charles Spofford, the chairman of the North Atlantic Council of Deputies, on 3rd May.

The announcement stated that henceforth the Council would incorporate the Defence Committee, composed of the Defence Ministers of the North Atlantic countries, and the Defence Financial and Economic Committee, consisting of the Finance Ministers of those countries, and would thereby become the sole ministerial body in the Organization.

It was added that the Council would meet once a year or whenever specially called, and would be served, as hitherto, by a permanent international staff in London under the Council of Deputies. The latter would, in future, not only represent their respective Foreign Ministers but also their Defence and Finance Ministers; would co-ordinate and guide the activities of all other permanent organs of the North Atlantic Treaty Organization; would exchange views on political matters within the scope of the Treaty; and would keep the public informed on the furtherance of its objectives.

It was also announced by Mr. Spofford that a Financial and Economic Board was to be set up in Paris to replace the Advisory Group on raw materials, and this Board was formally constituted on 24th May. The main tasks of the new Board are to examine economic and financial problems created by the joint defence effort; to advise on the equitable distribution of the burden arising from joint defence; and to advise the other organizations of the North Atlantic Treaty responsible to the Council of Deputies, and especially the Defence Production Board, on all economic and financial matters arising in the course of their work.

As a result of these changes the structure of the North Atlantic Treaty Organization is now as follows:—

NORTH ATLANTIC COUNCIL
NORTH ATLANTIC COUNCIL DEPUTIES
INTERNATIONAL STAFF (LONDON)
MILITARY COMMITTEE (CHIEFS OF STAFF)
MILITARY REPRESENTATIVES COMMITTEE (WASHINGTON)
STANDING GROUP REPRESENTATIVES OF BRITAIN, FRANCE & UNITED STATES (WASHINGTON)
SUPREME ALLIED COMMANDER, EUROPE (FRANCE)
DEFENCE PRODUCTION BOARD (LONDON)
FINANCIAL & ECONOMIC BOARD (PARIS)
PLANNING BOARD FOR OCEAN SHIPPING
INDICATES GROUPS IN PERMANENT SESSION

DEFENCE SHIPPING POOL.—The North Atlantic Planning Board for Ocean Shipping announced on 25th May that it had agreed on a plan for mobilizing ocean-going shipping in a single pool; for its allocation on a world-wide basis in time of war or war-time emergency; and for the establishment in such circumstances of an international organization of a civilian character, to be named the Defence Shipping Authority, which would have two branches, one in London and one in Washington, all participating Governments having the right to be represented in both. The announcement added that the agreement, which had resulted from the Board's recent meeting in London, had meanwhile been approved by the North Atlantic Council of Deputies.

COMMAND APPOINTMENTS, SOUTHERN EUROPE.—It was announced by General Eisenhower on 18th June that Admiral Robert B. Carney, United States Navy, had been appointed Commander-in-Chief, Allied Forces in Southern Europe. Admiral Carney will act initially as Commander of the Allied Naval Forces allocated to General Eisenhower in Southern Europe. He thus commands the United States Sixth Fleet, which was placed under the Supreme Commander by President Truman in January.

It was also stated in the same announcement that General de Castiglioni, of the Italian Army, had been appointed Commander, Allied Army Forces in Southern Europe, and that Major-General David M. Schlatter, United States Air Force, had become Commander, Allied Air Forces in the area.

This command structure, the announcement added, is designed to enable the Supreme Commander to proceed with his mission in Southern Europe.

These appointments have been made, it was explained, without prejudice to any command system which may be evolved by higher authority for the Mediterranean as a whole, and with due regard to the traditional interests and responsibilities of the United Kingdom, France, and Italy in the Mediterranean.

General Gruenther, General Eisenhower's Chief of Staff, explained that Admiral Carney would have no relations with Greece, Turkey, Yugoslavia or Spain, as they were not members of N.A.T.O.

DEFENCE COLLEGE.—It was announced on 3rd July that the North Atlantic countries have approved a S.H.A.P.E. recommendation for the early establishment of a North Atlantic Treaty Organization defence college in the Paris area. It is planned to have the college ready to commence the first course this autumn. Vice-Admiral d'Escadre André G. Lemonnier, of the French Navy, has been designated first Commandant of the College, in addition to his duties as Naval Deputy to General Eisenhower.

GREAT BRITAIN

HOME DEFENCE

The Ministry of Defence announced on 1st May that the Government had decided that responsibility for the defence of the United Kingdom in the event of war should be exercised by three Commanders-in-Chief responsible to the Chiefs of Staff, and that these Commanders-in-Chief would be :—

(1) Commander-in-Chief, Home Station : the Commander-in-Chief Portsmouth ; at present Admiral Sir Arthur Power.

(2) Commander-in-Chief, United Kingdom Land Forces : General Sir Miles Dempsey.

(3) Air Officer Commanding-in-Chief, Fighter Command ; at present Air Marshal Sir Basil Embry.

It was stated that General Sir Miles Dempsey would act as chairman of the new organization, to be known as the Commanders-in-Chief (United Kingdom) Committee, and had been provided with a small staff to facilitate the preliminary planning work being undertaken by the Committee in conjunction with the representatives of the Government Departments concerned and of the Civil Defence services.

End of State of War with Germany

The formal state of war between Great Britain and Germany was officially ended at 4 p.m. on 9th July. The Foreign Secretary, Mr. Morrison, announcing this in the House of Commons, said that simultaneous action was being taken by a number of Commonwealth and other countries allied to us in the 1939–45 War. This action was agreed upon by the Foreign Ministers of the three Western occupying Powers in New York last September, as was announced at the time.

This development, said Mr. Morrison, is further evidence of the determination of His Majesty's Government, the French Government and the United States Government to remove all possible obstacles to normal relations with the German Federal Government. His Majesty's Government have for some time past felt that the persistence of a state of war with Germany in the domestic law of the United Kingdom was not in accordance with the actual state of our relations with Germany. The present action will remove this legal anomaly and its effect on the status of Germans in this country. It should at the same time be understood that it in no way affects the position of the occupying Powers in Germany, or their responsibilities in connection with the conclusion of an eventual treaty with Germany, which are not based upon the persistence of a state of war either in international or domestic law.

Exercises

Exercise "Run Aground II".—Ships, landing craft, aircraft, tanks, and more than 600 Naval, Marine, Army and R.A.F. personnel co-operated in Exercise "Run Aground II," a demonstration to directing staffs and students of the Staff Colleges of the three Services of the methods and equipment used in amphibious assault landings.

Under the overall direction of Major-General H. T. Tollemache, who commands the Portsmouth Group, Royal Marines, the exercise took place on 9th, 10th and 11th May, at the R.M. Barracks, Eastney, Portsmouth, at beaches in that area, and also at Culver Cliff, near Sandown, Isle of Wight. The exercise was directed from a landing ship, H.M.S. "Meon."

Exercise "Red Dagger."—An "invasion" planned by Reserve Forces commanders in H.M.S. "President," headquarters ship of the London Division R.N.V.R., took place on 27th May.

It was known as exercise "Red Dagger" and the Task Force consisted of 22 landing ships and craft, operating with air cover, and carrying about 1,000 men almost all of whom were London Reservists or London Territorials.

It was the first combined amphibious exercise organized by Permanent Volunteer Reserves and the largest and most advanced Reserve Forces operation to take place in the South of England.

The landing was made on a stretch of coastline four miles East of Lulworth Cove, its purpose being to establish a beach-head in Worbarrow Bay, link up with an infantry division cut off by a strong "enemy" force, and later to advance to the Dorchester-Wareham Road to deny the lines of communication and use of the ports to the "enemy."

The terrain on this part of the South Coast, which is ideally suited for training purposes, presented considerable obstacles to the assault forces. Cliffs rising to several hundred feet were scaled by some of the attacking troops and the shingle beach offered little cover during the landing.

Ships and craft of the invasion fleet were manned largely by men of the R.N.V.R. and R.M.F.V.R. They sailed from Portsmouth and called at Portland to embark troops and military equipment of the 56th (London) Armoured Division (T.A.), and a Royal Marine Forces Volunteer Reserve Commando Troop.

The ships proceeded during the night to take up positions for a dawn landing on a front of about one and a half miles. The troops went ashore from landing craft under

cover of a simulated Naval bombardment, for which the destroyer, H.M.S. " Finisterre," was bombarding ship.

An air umbrella was provided by Seafire aircraft of No. 1831 R.N.V.R. Squadron, based on the Royal Naval Air Station at Stretton, Warrington, Lancs, and No. 1832 R.N.V.R. Squadron, based at Culham, near Abingdon, Berkshire. Harvard aircraft of Nos. 1831, 1832 and 1833 Squadrons (the last based at Bramcote, near Nuneaton, Warwickshire) also operated in support of the assault forces, who had about 50 aircraft to call on.

Three of the Squadrons were operated from the Royal Naval Air Station, Yeovilton, which, for the purpose of the exercise, was known as H.M.S. " Unobtainable," an assault aircraft carrier. Some Seafire aircraft of No. 1833 Squadron and Firefly aircraft of No. 1840 R.N.V.R. Squadron (the newly formed Squadron at present based on Culham) were operated by the " enemy " to attack the aircraft of the assault forces and to strike at their fleet and troops.

" Red Dagger " was planned under the direction of the Commanding Officer of the London Division of the R.N.V.R., the Officer Commanding Royal Marine Forces Volunteer Reserve, London Division, and the General Officer commanding the 56th (London) Armoured Division (T.A.).

EXERCISE " SCANDIA ONE."—This exercise, in which British, Danish, and Norwegian brigades and a squadron of the Royal Norwegian Air Force were involved, took place in the Sennelager area in Germany between 15th and 21st July. The exercise was directed by Major-General R. Holtermann, Norwegian Army Commander in Germany, assisted by Brigadier O. Bjerregaard of the Danish Forces.

THE ·280 INCH CALIBRE

The following summary was issued by the War Office on 22nd June :—

As the War drew to a close in 1945, the need to re-arm the Infantry with a light rifle of the self-loading type became increasingly evident. No lighter rifle could be produced if the ·303 inch ammunition were to be retained, since the recoil on the shoulder when fired from a light rifle would be excessive. A new round, therefore, became the primary requirement.

This provided an opportunity to dispense with the rimmed case of the ·303 inch ammunition which had been in use since the latter half of the last century. In the days before automatic weapons came into being a rimmed case was no disadvantage. For automatic weapons, however, a rimless case is most desirable to reduce the number of stoppages during firing and to simplify the mechanism of the gun.

In 1945, it was decided to appoint a Panel to report upon the best calibre, case, and bullet characteristics to permit the development of a self-loading rifle of as light a weight as possible. This Panel, after prolonged and extensive investigation, established that the ·280 inch calibre was ideal for general use.

The characteristics of the ·280 round permit a decrease of 12 oz. in the weight of the unloaded rifle. In addition, the ·280 inch cartridge gives an 18 per cent. saving in weight when compared with the existing British ·303 inch round. There is also a substantial decrease in length, which in turn provides a considerable reduction in bulk on large quantities of ammunition.

Following development work spread over three years, exhaustive trials have been carried out during the past 18 months with ammunition and semi-automatic rifles of .280 inch calibre. These show that :—

(*a*) The wounding power or incapacitating effect of ·280 inch is ample to fulfil requirements and its powers of penetration at the limits of range required are considerably better than those of ·303 inch.

(*b*) Despite these attributes the recoil produced when fired from the light rifle is substantially less than that of the ·303 inch fired from the existing Service rifle.

(*c*) The rate of aimed fire of the individual soldier will be at least three or four times greater than before.

(*d*) The functioning of the new rifle is more dependable in adverse conditions of dust and mud, extremes of climate, etc., than that of any comparable weapon in use.

(*e*) It is better than the present Service rifle when fired for accuracy at all Service ranges.

(*f*) It is robust and will withstand the full rigours of fighting with the bayonet, and yet is considerably easier to handle than the existing Service rifle.

The decision to change the calibre of our ammunition and to introduce a new rifle into the British Army has been taken only after a detailed and careful examination of the results of trials and experiments over the last five years.

Higher Service Pensions and New Terminal Grants

Accounts of the statement made on 30th July by the Minister of Defence regarding increases of retired pay and pensions for the Regular Armed Forces, and new terminal grants, appeared in the Press on 31st July. These changes apply to those retired and discharged to pension on or after 1st September, 1950.

DOMINIONS AND COLONIES

AUSTRALIA

Anzac Day.—Anzac Day was observed with time-honoured ceremonies throughout Australia on 25th April. At Canberra the Governor-General and members of the Diplomatic Corps attended a service at the National War Memorial. In Sydney more than 250,000 people lined the streets to cheer 30,000 veterans in one of the biggest Anzac Day marches for many years.

Cocos Islands.—The Colonial Secretary, Mr. James Griffiths, announced in a Parliamentary written answer on 22nd June that the Cocos Islands, situated in the Indian Ocean and hitherto administered by the Government of Singapore, would be transferred to Australian control at the request of the Australian Government.

The Colonial Secretary stated that the Australian Government had recently expressed the wish to develop for civil aviation purposes an airstrip constructed in the Cocos Islands for the R.A.F. during the last war and that, in view of the strategic advantages which would accrue to the Commonwealth as a whole from this development—which would involve substantial expenditure by the Australian Government—the United Kingdom Government, after consultation with the Government of Singapore, had agreed to the transfer. After recalling that the islands had been leased by the Crown in 1886 to George Clunies Ross and his successors in perpetuity, the statement added that the transfer would not impair the title of the leaseholder.

NEW ZEALAND

Anzac Day

Anzac Day was commemorated throughout New Zealand on 25th April with undiminished enthusiasm. Memorial parades of ex-service men of the two World Wars took place in every city, township and village. At the Auckland ceremony the Governor-General read a message from The King. A dawn parade and a citizens' service at the Cenotaph marked the observances at Wellington.

SOUTH AFRICA

Changes in Senior Defence Force Posts

Changes in senior posts of the Union Defence Forces were announced on 21st June. The titles Director-General Land Forces and Director-General Air Force have been replaced by Deputy Chief of Staff (Land) and Deputy Chief of Staff (Air).

Brigadier P. de Waal, the present Quarter-Master-General, has been appointed Deputy Chief of Staff (Naval and Marine); Commodore F. J. Dean, the present Director-General Naval forces, has been appointed Commodore commanding Coastal Command. The Naval Forces Directorate at General Headquarters has been abolished. Brigadier H. B. Klopper, the present Director-General Land Forces, has been appointed Deputy Chief of Staff (Land); Brigadier H. J. Bronkhorst, the present acting Director-General Air Force, has been appointed Quartermaster-General. No appointment has yet been announced of a Deputy Chief of Staff (Air).

MALAYA

Three-Power Military Discussions

A conference to discuss the military situation in South-East Asia was held in Singapore from 15th to 18th May, being attended by senior British, French and United States officers. Great Britain was represented by Admiral the Hon. Sir Guy Russell, General Sir John Harding and Air Marshal Sir Francis Fogarty, the three Commanders-in-Chief in the Far East; France by General de Lattre de Tassigny, High Commissioner and Commander-in-Chief in Indo China, and French Commanders in Indo-China; and the United States by Vice-Admiral Arthur D. Struble, Commander of the United States First Fleet, and Brigadier-General Francis G. Brink of the United States Military Aid Mission in Vietnam. Military observers were present from Australia and New Zealand.

No announcement was made as to the subjects discussed. A brief communiqué stated that unanimous agreement had been achieved, that the discussions were confined wholly to military problems, and that recommendations would be presented to the three Governments concerned.

HONG KONG

Defence Force Title.—*The London Gazette* announced on 1st May that The King had approved the changing of the title of the Hong Kong Defence Force to the Royal Hong Kong Defence Force. This Force has been reconstituted since the War from the Colony's former volunteer forces, and comprises naval, military, air, and other components.

FOREIGN

BURMA

Treaty with Indonesia.—A five-year treaty of friendship was signed in Rangoon on 31st March between Burma and Indonesia, aiming at "closer co-operation and the establishment of peace between the two countries with a view to strengthening existing ties of friendship and promoting common benefit." The treaty was the first of its kind signed by Burma with any foreign country since the attainment of Burmese independence in 1948.

Treaty with India.—It was reported from Rangoon on 8th July that Burma and India have signed a treaty of friendship. The treaty was signed in Burmese, Hindi and English. The main provision is that, to further development of friendship in all spheres, representatives of both countries should meet from time to time to exchange views and find ways and means for mutual co-operation.

CHINA

The Chinese Armed Forces

The following appraisal of the Chinese Armed Forces, analysing their strengtn, organization, service conditions, and way of life, was issued by the War Office on 18th March:—

> "The Chinese Armed Forces, including the Navy, Air Force, and military district troops, total over 4,000,000 men. The Regular Army (about 2,500,000 men) provides a field force of approximately 80 armies. These armies, or as we would call them,

'corps,' are all infantry formations, and consist of three infantry divisions and supporting arms.

The Chinese Army is predominantly an infantry force, which overcomes its lack of air, armoured, and heavy artillery support by means of infiltration tactics, usually at night; good use of ground and cover; and a flexibility of plan, both in attack and defence, in which the principle is to avoid the enemy where he is strongest and, instead, to concentrate on his weakest point.

Chinese tactics are greatly helped by the ability of the Chinese soldier to live on the most meagre rations. The Chinese Army, therefore, is far less dependent on supply trains than Western armies, and is able to pay proportionately less attention to its lines of communication in the rear. Equipment is adequate but heterogeneous in origin, mostly Japanese, American, or locally produced. More and more Russian equipment is becoming available. Troops in the field live largely off the country.

Rations are very simple—basically vegetables and rice or flour. Nevertheless, troops are probably better fed than they would be in civil life. Pay is nominal. Political Commissioners are on the establishment of all formations and larger units. Lower levels, down to sections, have Communist Party members. Except in operations, all decisions by military commanders are subject to the approval of Political Commissioners and their representatives.

The Chinese soldier is brave, tough, and resilient, being cheerful, with a sense of humour. He is able to live and fight on very little, and is intelligent, but under-educated and naive. He is also excitable and lacking in self-control. The Chinese Army is a well-trained and well-disciplined infantry force, with high morale. It has unlimited manpower at its disposal.

The striking difference between the modern Chinese Army and its predecessors is due to (*a*) the new Chinese nationalism which has been fortified by success in the civil war and in Korea; (*b*) honest administration, in other words, the Chinese soldier, though promised little, gets what he is promised; and (*c*) good officers who work with and lead their troops."

FRANCE

Readiness of Armed Forces for Defence

M. Moch, the Defence Minister, announced in a speech on 5th May that France had undertaken to have five divisions on a war footing (four of which were already in Germany), and five others available at three days' notice by the end of this year. He said that these ten divisions will be increased to 15 before the end of 1952, to 20 before the end of 1953, and eventually to 30. He added that an air force is also being built up which, as a result both of foreign deliveries and of national output, will have on its strength, within the time stated, the number of aircraft which France had undertaken to provide.

GERMANY

War Casualties, 1939–45

Figures issued on 28th March by the Federal Bureau of Statistics in Bonn showed that German casualties during the 1939–45 War, both at the front and at home, totalled over 5,000,000. Over 3,200,000 were killed in action, of which the deaths of 1,650,000 had been officially confirmed by 29th October, 1946, while most of the 1,600,000 reported missing at the time were presumed to be dead. About 500,000 civilians were killed in bombing raids and there are some 2,000,000 disabled war veterans.

The report stated that the figures of military and civilian casualties would never be known with exactitude, and were in all probability higher than those given. In Western Germany alone the number of disabled war veterans of the two World Wars is 2,011,887. The mortality rate among wounded soldiers was considerably higher in 1939–45 than in 1914–18.

GREECE

RESIGNATION OF FIELD-MARSHAL PAPAGOS.—The resignation of Field-Marshal Papagos, Commander-in-Chief of the Greek Armed Forces, was announced in Athens on 30th May, and it was reported on the following day that his functions as Commander-in-Chief would be taken over by King Paul.

REORGANIZATION OF SENIOR MILITARY POSTS.—On 31st May, it was announced that a reorganization of senior army posts had been carried out under which Lieut.-General Gregoropoulos, the Chief of Staff of the Army, had been appointed Chief of the National Defence Staff; Lieut.-General Tsakalotos, Inspector-General of the Army, would succeed Lieut.-General Gregoropoulos as Chief of Staff of the Army; and Lieut.-General Kitrilakis, Deputy Chief of Staff, would become Inspector-General of the Army. A decree of 31st May further provided that in time of war or of general or partial mobilization, or in special circumstances, the functions of the Commander-in-Chief of the Armed Forces would be assumed by the Chief of the National Defence Staff.

GREENLAND

AGREEMENT FOR JOINT DEFENCE

An agreement between Denmark and the United States for the joint defence of Greenland was signed in Copenhagen on 27th April by Hr. Ole Björn Kraft, the Danish Foreign Minister, and Mrs. Eugenie Anderson, the United States Ambassador, following negotiations which lasted from 27th March to 25th April.

A communiqué issued in Copenhagen and Washington on the same date stated that the agreement, which had been concluded within the framework of the North Atlantic Treaty Organization, would replace the provisional agreement of 9th April, 1941, under which the United States had set up defence bases in Greenland during the last war, and would come into operation after ratification by the Danish *Rigsdag*.

ICELAND

DEFENCE AGREEMENT WITH THE UNITED STATES

It was announced in Reykjavik and Washington on 7th May that a defence agreement between Iceland and the United States had been signed in the Icelandic capital on that date by Hr. Benediktsson, the Iceland Foreign Minister, and Mr. Edward Lawson, the United States Minister. It was also announced that a first contingent of 280 men of the United States Navy, Army, and Air Force had arrived at Keflavik airport at the invitation of the Icelandic Government and in accordance with strategic plans under the North Atlantic Treaty Organization.

The defence agreement, which superseded an agreement of 10th October, 1946, under which the Lockheed Overseas Aircraft Corporation had been operating the American-built Keflavik airport as an international civilian aerodrome, provided that Iceland would make available to the United States, without compensation, land and such other facilities as were found to be mutually necessary, and that the United States would make arrangements for the defence of Iceland who has no armed forces of her own. It also provided that Iceland would retain control over the number of troops to be stationed in the island, and that she would remain responsible for the civilian operations at Keflavik airport.

INDO-CHINA

STRENGTH OF THE FRENCH EXPEDITIONARY CORPS.—In an address to the Anglo-American Press Association in Paris on 9th May, the Minister for the Associated States, M. Letourneau, announced that the French Expeditionary Corps in Indo-China consisted of 51,000 troops from metropolitan France, 18,000 soldiers of the Foreign Legion, 26,000 North Africans, 15,000 Africans, and 56,000 Indo-Chinese, together with 17,000 naval and air personnel (nearly all French) and 42,000 native auxiliaries. M. Letourneau

pointed out that to these figures must be added those of the rapidly expanding national force of the Indo-Chinese States which at present numbers about 162,000.

CASUALTIES.—M. Letourneau stated that losses in killed incurred by forces of France and the French Union in Indo-China between 1945 and 31st March, totalled 9,925 Frenchmen from metropolitan territory, 4,893 *Legionnaires*, 4,762 North Africans, 1,345 Africans, 8,002 Indo-Chinese, and 1,000 (all French) of the naval and air forces.

COST.—The Minister added that the cost of the Indo-China operations to the French Treasury to date was between 700,000 million and 800,000 million francs.

KOREA

For a diary of the War in Korea see page 474.

NETHERLANDS

REARMAMENT PROGRAMME

Details of the Netherlands defence programme under the North Atlantic Treaty Organization were given in a Government memorandum submitted to the *States-General* on 7th May The memorandum stated that the total defence expenditure over the next four years would amount to 6,000,000,000 guilders, to be divided in the proportion of 3,545,000,000 guilders for the Army, 1,295,000,000 guilders for the Navy, 1,080,000,000 guilders for the Air Force, and 80,000,000 for Civil Defence.

Apart from the contribution of five infantry divisions to the collective defence of the West, as already reported, the programme envisaged the formation of a number of territorial units, including A.A. troops. It also provided for the formation of 21 fighter squadrons (including night-fighter aircraft) and several squadrons of reconnaissance, artillery observation, and transport planes, as well as the building of the necessary airbases, and for armament production to be increased to the maximum. The construction of Fokker aircraft was stated to be the subject of a contract with Belgium, and negotiations were also reported to be under way for building minesweepers.

The memorandum stated that the naval contribution offered by the Netherlands had been accepted to its full extent by her other Allies in the North Atlantic Organization, and expressed appreciation of the effective co-operation with the British Navy and of the support the Royal Netherlands Navy was receiving from the British authorities.

Regarding the increase of the conscription period from 12 to 18 months, it was pointed out that it would, for the time being, be 16 months because of certain technical considerations, but, if the international situation made it necessary, training would be prolonged by another four months to a total of 20 months.

Barring unforeseen circumstances, it was considered that the country would reach the apex of the naval and military effort of which it was capable by the end of 1954.

RUSSIA

THE SOVIET ARMED FORCES

The following appraisal of the Armed Forces of the Soviet Union, analysing their strength, organization, service conditions, and way of life, was issued by the War Office on 18th March :—

" The Government of the U.S.S.R. takes deliberate and thorough measures (with varying degrees of success) to prevent information from the Soviet Army reaching the Western nations. Some of the information given here is unavoidably based on circumstantial evidence. These notes represent the best available information which it is desirable, on security grounds, to publish at the present time.

" The strength of the Soviet Armed Forces, including the Army, Navy, Air Force, and the troops of the M.V.D. (Ministry of Internal Affairs) and M.G.N. (Ministry of State

Security), is over 4,000,000 men. The Soviet Army, which has a strength of 2,800,000, includes approximately 175 ' line ' divisions. These divisions are organized in ' rifle armies ' and ' mechanized armies,' the latter consisting of two tank divisions and two mechanized divisions (with no corps organization), and supporting arms. Rifle armies consist of two or three rifle corps, each of which includes two rifle divisions, a mechanized division, and supporting arms.

" Virtually all officers serve on Regular engagements, so far as is known, without voluntary retirement. This means that they just serve until reaching retirement age unless they are industrial specialists, or become ' politically decomposed,' or are unfit for duty owing to illness or inefficiency. Under the conscription law private soldiers serve for two years and n.c.o.s for three years. There is, however, much evidence that, at any rate so far as the occupation forces in Europe are concerned, a decree was promulgated verbally during 1950 by which privates are now required to serve for three years and n.c.o.s for four years. The Soviet soldier's day appears to last from 7 a.m. to 11.45 p.m. (or sometimes from 5 a.m. to 10.30 p.m.) with less than two hours' free time, at least in occupied Europe. This long conscription period results in Soviet troops receiving thorough and comprehensive training.

" The equipment of the Soviet Army is simple, robust, and reliable, and includes very great numbers of excellent tanks and artillery weapons. The U.S.S.R. was greatly helped by the handing-over by the Western Allies, under Lease-Lend, of large quantities of weapons and equipment during World War II. Rations are very simple by Western standards and meals for other ranks consist mainly of soup and bread. Officers are able to supplement their rations by buying extra food at special shops run by the State. A private soldier receives 1s. 9d. a day until he has served for three years. A major-general in occupied Europe appears to receive the equivalent of over £7,000 a year, out of which he will make a ' voluntary ' contribution to the State loan of one or perhaps two months' pay. All ranks are compelled in practice to make such compulsory saving.

" Discipline is very strict and punishments severe. In World War II officers and other ranks who did not fulfil all that was expected of them were sent to penal battalions and companies. The German Army found that well-nigh suicidal tasks were frequently allotted to these penal units. Many deserters and other sources have confirmed that, since mid-1947, other ranks are normally confined to barracks in occupied Europe, except when on duty. All say that this is mainly in order to prevent comparisons, unfavourable to the Soviet Union, between living standards in, for example, Germany and the U.S.S.R., with consequent disillusion as regards Communist propaganda. Nevertheless these same deserters state that numbers of Soviet troops contrive individually to ' break-out ' of barracks.

" The Soviet Armed Forces are completely permeated by two vast internal informer-networks—one organized by the Communist party and Young Communist organization and the other by the Ministry of State Security.

" On the whole, Soviet soldiers are brave, stubborn, and physically tough ; instances have been known of Soviet troops fighting successfully in a temperature of minus 43 degrees Fahrenheit. All ranks, however, have a lower average education standard than their ' opposite numbers ' in Western armies. Officers have many privileges. Their pay, as against other ranks' pay, is vastly higher than in Western armies.

" The dominant factor regarding the Soviet army is its vast mass of 175 ' line ' divisions of tough troops, backed by very large reserves of partially-trained and expendable manpower."

TURKEY

Combined Manœuvres

The Turkish Fleet in conjunction with land forces carried out combined manœuvres along the coast from Alexandretta to Smyrna during the last week in May. President

Bayar, accompanied by the Minister of National Defence and the Chief of General Staff, followed the manœuvres from a destroyer.

UNITED STATES

COMMEMORATION CEREMONY.—On 4th July, in the presence of The Queen, Princess Elizabeth, Duchess of Edinburgh, and Princess Margaret in St. Paul's Cathedral, General Eisenhower presented to the cathedral a Roll of Honour of the 28,000 men and women of the United States Forces who died in the War in military operations from the United Kingdom.

The Roll of Honour, a finely illuminated manuscript bound in red leather, is the joint work of American and British artists and craftsmen. It is a gift from the United States, and its eventual resting place will be the focal point of the United States Memorial Chapel that is to be embodied in a reconstructed East end of St. Paul's.

LIEUT.-GENERAL RIDGWAY PROMOTED.—Lieut.-General Mathew B. Ridgway, Supreme Allied Commander in Japan, United States Commander-in-Chief in the Far East, and United Nations Supreme Commander in Korea, was promoted to the rank of General by President Truman on 9th May.

SUPPLEMENTARY APPROPRIATIONS, 1950–51.—A supplementary Appropriation Bill for a further $6,442,668,000 in the 1950–51 fiscal year, most of which was for defence, was signed by President Truman on 31st May, after having been unanimously passed by the House of Representatives on 26th April and by the Senate on 24th May. Of the total, $1,645,400,000 was for the Navy, $2,847,500,000 for the Army, and $1,886,600,000 for the Air Force, bringing the total defence appropriations in the financial year 1950–51 to $48,200,000,000.

DEFENCE BUDGET, 1951–52.—On 30th April, President Truman submitted a recommendation to Congress for defence appropriations in the fiscal year 1951–52, amounting $60,679,414,690, of which $1,424,839,700 was for the liquidation of prior authorizations and the balance for new obligational authority. The main items included in the defence programme were as follows :—

	$
Military personnel costs	10,475,809,000
Operation and maintenance	12,264,400,000
*Major procurement and production costs	29,743,381,000
Acquisition and construction of real property	4,500,000,000
Civilian components	713,751,000
Research and development	1,472,632,000
Industrial mobilization	143,555,000

*Including $14,464,753,000 for aircraft ; $1,944,595,000 for ships and harbour craft; $4,880,425,000 for combat vehicles and artillery ; and $2,719,405,000 for ammunition and guided missiles.

FOREIGN ECONOMIC AND MILITARY ASSISTANCE.—On 24th May, President Truman submitted to Congress a request for $8,500,000,000 in appropriations for foreign economic and military aid in the financial year 1951–52, the total being divided as follows :—

	Economic	*Military*
	$	$
Europe	1,650,000,000	5,240,000,000
Middle East and North Africa	125,000,000	415,000,000
Asia	375,000,000	555,000,000
Latin America	22,000,000	40,000,000
Administrative Expenses	78,000,000	
Total	2,250,000,000	6,250,000,000

Military aid for Greece and Turkey is included in the amount for the Middle East, but economic aid for these countries is included in that for Europe.

In his accompanying message to Congress the President explained that this mutual security programme combined the arms aid under the Mutual Defence Assistance Pact, economic assistance for Europe under the European Recovery Programme, and economic aid to under-developed countries under the " Point Four " Programme.

The Julian Corbett Prize in Modern Naval History

(*a*) A Prize, at present of the value of £50, and known as the Julian Corbett Prize for Research in Modern Naval History, will be awarded by the Senate, on the recommendation of the Institute of Historical Research Committee, for work based on original (MS. or printed) materials for Modern Naval History.

(*b*) The work shall take the form of either (*a*) a dissertation, (*b*) an edition of an original document or series of documents, or (*c*) a report on material at home or abroad, illustrating Modern Naval History.

(*c*) The Prize will be open to competition to any investigator who satisfies the Committee of the Institute of Historical Research that he is a student of naval history qualified to undertake the research.

(*d*) Candidates shall, on or before 1st October in the year preceding that in which they intend to enter for the Prize, submit for the approval of the Institute of Historical Research Committee the subject of their proposed work; and no work shall be eligible for the Prize unless the subject has thus been approved by the Committee.

(*e*) The award will be made annually, and the work submitted for the next award shall be sent in, on or before 1st October, 1951, to the Secretary of the Institute of Historical Research, Senate House, London, W.C.1.

(*f*) If at any competition no award is made, the Senate may, on the recommendation of the Institute of Historical Research Committee, add the amount of the award to the capital of the Fund or apply it to any of the following purposes: increasing the value of the prize, awarding a second prize to a deserving candidate, providing for the expense of publishing works submitted, purchasing for the Institute books or equipment necessary for research in Modern Naval History, or any other means of encouraging research in that subject at the Institute.

(*g*) If the successful work is published, it shall bear on the title-page the words, " Awarded the Julian Corbett Prize for Research in Modern Naval History, University of London." Whether or not publication *in extenso* is practicable, a précis of the successful thesis shall be published in the *Bulletin* of the Institute.

NAVY NOTES

GREAT BRITAIN

H.M. The King

The King, acting on medical advice, having cancelled his visit, the Queen and Princess Margaret left Liverpool for Northern Ireland in the cruiser " Sheffield " on the night of 31st May, accompanied by the destroyers " Battleaxe " and " Broadsword," and landed at Belfast on 1st June. The return journey was made to London by air on 4th June.

Surgeon Captain (D) L. B. Osborne has been appointed an Honorary Dental Surgeon to the King from 5th April, 1951.

Princess Elizabeth and the Duke of Edinburgh

On 3rd July, Princess Elizabeth formally opened the East wing of the National Maritime Museum at Greenwich. The wing is to be known as the Caird Galleries, to commemorate the name of Sir James Caird, a further gift from whom has made possible the opening of this wing as an integral part of the museum.

The Duke of Edinburgh relinquished the command of H.M. frigate " Magpie " at Malta on 16th July, before returning to England by air. It was stated in February that after giving up this command he would not assume another naval appointment until the King and Queen return from their Commonwealth tour in 1952.

H.M. the King of Sweden

In pursuance of His Majesty's pleasure, H.M. King Gustavus VI Adolf of Sweden, of the Goths and the Vends, G.C.B., G.C.V.O., has been appointed an Honorary Admiral in His Majesty's Fleet, to date 1st May, 1951.

At Stockholm on 27th May, it was announced that King George VI has been appointed an Honorary Admiral in the Royal Swedish Navy.

Board of Admiralty

The King has been pleased, by Letters Patent under the Great Seal, bearing date the 30th day of May, 1951, to appoint the following to be Commissioners for executing the office of Lord High Admiral of the United Kingdom :—

Right Hon. Francis Aungier, Baron Pakenham.
Admiral of the Fleet Bruce Austin, Baron Fraser of North Cape, G.C.B., K.B.E.
Vice-Admiral Alexander C. G. Madden, C.B., C.B.E.
Vice-Admiral Sir Michael M. Denny, K.C.B., C.B.E., D.S.O.
Vice-Admiral the Right Hon. Louis F. A. V. N. Earl Mountbatten of Burma, K.G., G.C.S.I., G.C.I.E., G.C.V.O., K.C.B., D.S.O.
Vice-Admiral Maurice J. Mansergh, C.B., C.B.E.
Admiral Sir George E. Creasy, K.C.B., C.B.E., D.S.O., M.V.O.
Rear-Admiral Edward M. Evans-Lombe, C.B.
Lieutenant Leonard J. Callaghan, R.N.V.R.
Walter J. Edwards, Esq.
Sir John G. Lang, K.C.B.

The resignation of Lord Hall as First Lord and the appointment of Lord Pakenham to succeed him were announced on 25th May. Lord Hall, who had been in poor health, resigned on personal grounds.

Honours and Awards

Birthday Honours

The following were among the honours conferred on the occasion of the official celebration of the King's Birthday on 7th June :—

K.C.B.—Vice-Admiral Alexander C. G. Madden, C.B., C.B.E. ; General Sir Leslie C. Hollis, K.B.E., C.B., R.M.

C.B.—Rear-Admiral E. M. C. Abel Smith, C.V.O. ; Rear-Admiral (E) Sydney Brown ; Rear-Admiral I. M. R. Campbell, D.S.O. ; Rear-Admiral A. Day, C.B.E., D.S.O. ; Rear-Admiral H. W. Faulkner, C.B.E., D.S.O. ; Rear-Admiral R. M. J. Hutton, C.B.E., D.S.O. ; Rear-Admiral S. M. Raw, C.B.E. ; Rear-Admiral J. F. Stevens, C.B.E.

K.B.E.—Vice-Admiral H. W. U. McCall, C.B., D.S.O. ; Rear-Admiral (E) W. S. Jameson, C.B., C.B.E.

Flag Appointments

First Sea Lord.—The King has approved the appointment of Admiral Sir Rhoderick R. McGrigor, G.C.B., D.S.O., to be First Sea Lord and Chief of Naval Staff, in succession to Admiral of the Fleet Lord Fraser of North Cape, G.C.B., K.B.E., the appointment to take effect about December, 1951.

V.C.N.S.—The King has approved the appointment of Vice-Admiral Guy Grantham, C.B., C.B.E., D.S.O., to be Vice Chief of Naval Staff, in succession to Admiral Sir George E. Creasy, K.C.B., C.B.E., D.S.O., M.V.O., the appointment to take effect in October, 1951.

Fifth Sea Lord.—The King has approved the appointment of Rear-Admiral E. W. Anstice, C.B., to be a Lord Commissioner of the Admiralty, Fifth Sea Lord, and Deputy Chief of Naval Staff (Air), in succession to Vice-Admiral M. J. Mansergh, C.B., C.B.E., the appointment to take effect in September, 1951.

Plymouth.—The King has approved the appointment of Vice-Admiral M. J. Mansergh, C.B., C.B.E., to be Commander-in-Chief, Plymouth, in succession to Admiral Sir Rhoderick R. McGrigor, G.C.B., D.S.O., the appointment to take effect in November, 1951.

West Indies.—The King has approved the appointment of Vice-Admiral Sir William G. Andrewes, K.B.E., C.B., M.V.O., to be Commander-in-Chief, America and West Indies Station, in succession to Vice-Admiral Sir Richard V. Symonds-Tayler, K.B.E., C.B., D.S.C., the appointment to take effect in October, 1951.

Mediterranean Destroyers.—Rear-Admiral F. R. Parham, C.B., C.B.E., D.S.O., has been appointed Flag Officer (Destroyers), Mediterranean, in succession to Vice-Admiral P. B. R. W. William-Powlett, C.B., C.B.E., D.S.O., the appointment to take effect about October, 1951.

Interview Board.—Rear-Admiral D. H. Everett, C.B., C.B.E., D.S.O., has been appointed President of the Admiralty Interview Board, in succession to Rear-Admiral W. G. A. Robson, D.S.O., D.S.C., the appointment taking effect in July, 1951.

Training Squadron.—Rear-Admiral R. M. Dick, C.B., C.B.E., D.S.C., has been appointed Flag Officer, Training Squadron, in succession to Rear-Admiral St. J. A. Micklethwait, D.S.O., the appointment to take effect about August, 1951.

Flying Training.—Captain W. T. Couchman, D.S.O., O.B.E., has been appointed Flag Officer, Flying Training, with the acting rank of Rear-Admiral, in succession to Rear-Admiral E. W. Anstice, C.B., the appointment to take effect in August, 1951.

Greek Naval Mission.—Rear-Admiral P. S. Smith, D.S.O., has been appointed Head of the British Naval Mission in Greece, in succession to Rear-Admiral R. K. Dickson, C.B., D.S.O., the appointment taking effect in May, 1951.

D.C.N.P.—Rear-Admiral R. S. Warne, C.B.E., has been appointed Deputy Chief of Naval Personnel, in succession to Rear-Admiral F. R. Parham, C.B., C.B.E., D.S.O., the appointment to take effect in August, 1951.

GERMANY.—Rear-Admiral R. St. V. Sherbrooke, V.C., D.S.O., has been appointed to be Flag Officer, Germany, and Chief British Naval Representative on the Allied Control Commission, in succession to Rear-Admiral G. W. G. Simpson, C.B., C.B.E., the appointment to take effect in November, 1951.

PORTSMOUTH DOCKYARD.—Rear-Admiral A. G. V. Hubback, C.B.E., has been appointed Admiral Superintendent, H. M. Dockyard, Portsmouth, in succession to Vice-Admiral W. Y. La R. Beverley, C.B., C.B.E., the appointment to take effect in October, 1951.

NORTHERN EUROPE.—Admiral Sir Patrick Brind, G.B.E., K.C.B., Commander-in-Chief, Northern Europe, has selected Captain H. Dalrymple-Smith, R.N. (Retired) as his Chief of Staff. This officer will hold the rank of Acting Rear-Admiral during the tenure of his appointment. With the approval of the Supreme Allied Commander, Europe, Admiral Brind assumed full duty as Commander-in-Chief, Allied Forces, Northern Europe, on 1st June.

CIVIL APPOINTMENTS

DIRECTOR OF NAVAL CONSTRUCTION.—The First Lord has approved the appointment of Mr. V. G. Shepheard, C.B., M.I.N.A., as Director of Naval Construction, with effect from 1st October, 1951, in succession to Sir Charles Lillicrap, K.C.B., M.B.E., M.I.N.A., who retires on 30th September, 1951.

FLEET SCIENTIFIC OFFICER.—Mr. R. J. Gossage, a principal scientific officer in the Royal Naval Scientific Service, has been appointed Fleet Scientific Officer to the Commander-in-Chief, Home Fleet from 21st May. This is the first appointment of a sea-going scientific adviser to the staff of a Commander-in-Chief in the Royal Navy.

PROMOTIONS AND RETIREMENTS

The following were announced to date 1st May, 1951 :—

Admiral Sir Reginald H. Portal, K.C.B., D.S.C., to be placed on the Retired List at his own request to facilitate the promotion of junior officers.

Rear-Admiral C. P. Clarke, C.B., D.S.O., to be placed on the Retired List.

Vice-Admiral Sir W. Edward Parry, K.C.B., to be promoted Admiral in H.M. Fleet and to be reappointed as Commander-in-Chief and Chief of Naval Staff, Indian Navy.

Rear-Admiral E. W. L. Longley-Cook, C.B., C.B.E., D.S.O., to be promoted Vice-Admiral in H. M. Fleet and to be reappointed as Director of Naval Intelligence.

The following was announced with effect from 8th May, 1951 :—

Rear-Admiral A. D. Nicholl, C.B., C.B.E., D.S.O., to be placed on the Retired List. Rear-Admiral Nicholl was to take up the post of Military Correspondent to the B.B.C. Overseas Service.

The following was announced on 12th June :—

Instructor Captain W. A. Bishop, C.B., O.B.E., M.A., A.D.C., to be Instructor Rear-Admiral, as from 30th March, 1951, and to be reappointed as Director of the Naval Education Service.

This is the first promotion to the rank of Instructor Rear-Admiral. An Order in Council of 31st May, published in *The London Gazette* on 1st June, stated that the Head of the Instructor Branch of the Navy was responsible for advising the Board on all questions affecting the Educational Services, and it was considered that such duties had so increased in scope and complexity as to justify the officer so appointed being granted the rank of Instructor Rear-Admiral in H.M. Navy, under the following conditions : compulsory retirement at the age of 60 ; full pay and allowances, as for Rear-Admiral.

Half-Yearly Lists

The Admiralty announced the following promotions and retirements to date 7th July, 1951 :—

To be Promoted to Rear-Admiral in H.M. Fleet :—

Captain (Commodore 2nd Class) R. S. Warne, C.B.E., A.D.C.
Captain J. W. M. Eaton, D.S.O., D.S.C.
Captain (Acting Rear-Admiral) G. Barnard, C.B.E., D.S.O.
Captain R. St. V. Sherbrooke, V.C., D.S.O.
Captain A. D. Torlesse, D.S.O.
Captain N. V. Dickinson, D.S.O., D.S.C.
Captain (Commodore 2nd Class) A. G. V. Hubback, C.B.E.

To be Placed on the Retired List in the Rank of Captain :—

Captain A. J. B. Cresswell, D.S.O., A.D.C.
Captain C. S. B. Swinley, D.S.O., D.S.C., A.D.C.
Captain S. Boucher, C.B.E., A.D.C.
Captain G. P. Claridge, A.D.C.
Captain L. M. Shadwell, A.D.C.
Captain S. B. de Courcy-Ireland, A.D.C.
Captain D. C. Hill, D.S.O.
Captain C. B. Tidd, A.D.C.
Captain A. M. Knapp.
Captain H. A. King, D.S.O.
Captain H. P. Henderson, D.S.O.

On promotion Rear-Admirals Barnard and Torlesse remain in their present appointments until relieved. Rear-Admiral Barnard is on loan to India to command the Indian Naval Squadron. Rear-Admiral Torlesse, late in command of the aircraft carrier "Triumph," is engaged on temporary duties at the Admiralty with the Deputy Chief of the Naval Staff.

The following promotions were made to date 30th June, 1951 :—

Commander to Captain.—C. P. Coke, D.S.O. ; G. D. A. Gregory, D.S.O. ; N. W. Fisher, O.B.E. ; M. K. Cavenagh-Mainwaring, D.S.O. ; A. B. Cole, D.S.C. ; E. G. Irving, O.B.E. ; L. W. A. Bennington, D.S.O., D.S.C. ; P. M. B. Chavasse, D.S.C. ; A. S. Webb ; N. J. Wagstaff ; J. M. Hodges, D.S.O. ; C. B. Brooke ; J. C. C. Henley ; S. H. Beattie, V.C. ; N. E. G. Roper, D.S.O. ; R. B. N. Hicks, D.S.O. ; W. J. Munn, D.S.O., O.B.E. ; E. V. St. J. Morgan, D.S.C. ; E. T. L. Dunsterville ; J. A. Ievers, O.B.E.

Commander (L) to Captain (L).—W. W. H. Ash ; D. Campbell.
Instructor Commander to Instructor Captain.—P. Bracelin, O.B.E.
Surgeon Commander to Surgeon Captain.—C. B. Nicholson.
Commander (S) to Captain (S).—J. S. Lancaster ; J. K. Highton, O.B.E. ; R. W. Paffard, C.B.E.

Exercises and Cruises

Home Fleet.—Ships of the Home Fleet left their bases on 24th April for the summer cruise lasting three months. Their programme included training at Invergordon, various exercises and manœuvres, and visits to more than 50 ports and resorts in the United Kingdom in connection with the Festival of Britain. From 14th to 20th June, the aircraft carrier "Indomitable," flagship of the Commander-in-Chief, Admiral Sir Philip Vian, accompanied by the destroyer "Cadiz," visited Stockholm, where the Admiral was received by King Gustavus Adolf, who for the first time wore the uniform of a British Admiral.

N.A.T.O. Exercises.—During June and July, navies of the North Atlantic Treaty Organisation Powers took part in a series of execrises in the Atlantic, English Channel, and Southern North Sea. Early in June, British, Danish, French, Netherlands, and Norwegian forces assembled in the harbour of Douarnenez, France, for a week's combined exercises, known by the code-name " Progress." The 48 units taking part included one aircraft carrier, four cruisers, 23 destroyers and frigates, and 13 submarines. In addition, about 100 aircraft of the Royal and French Air Forces and British and French naval aircraft took part. The exercises were directed by Vice-Admiral Pothuau, Commanding the French Naval Squadron, and on their conclusion the combined fleet proceeded to Cherbourg, where a post-exercise conference was held. From later in June until 6th July, minesweepers of N.A.T.O. countries held minesweeping exercises, known by the code-word " Factotum," off the Netherlands coast, under the command of the Commander-in-Chief, Netherlands Home Station, Rear-Admiral C. W. Slot. A convoy exercise, " Velox," was also held in the English Channel and Southern North Sea.

Norway Cruise.—Five ships of the Third Training Flotilla, based on Londonderry, made a cruise to Norway in April under the command of Captain P. L. Saumarez in the destroyer " Crispin." Three ships visited Bergen and Odda and two went to Haugesund and Norheimsund.

Submarine Exercise.—Over 30 surface vessels and 18 submarines took part in the summer exercise held by the Flag Officer (Submarines), Rear-Admiral S. M. Raw, in the Irish Sea and Western Approaches in June. The exercise was on similar lines to those organized annually since 1946. Several of the submarines involved, including two of the Royal Netherlands Navy, joined in after taking part in a N.A.T.O. exercise.

R.N.V.R. Minesweepers.—Early in June five R.N.V.R. Divisions combined to form the 101st Minesweeping Flotilla and take part in an exercise in Kirkaldy Bay, Firth of Forth. This was the first time since the War that a minesweeping flotilla had been composed entirely of R.N.V.R.-manned ships. Seven days were spent sweeping mines laid by the destroyer " Opportune ".

Mediterranean.—Representatives of N.A.T.O. countries which have naval units in the Mediterranean met in Malta in the week beginning on 21st May for a joint study of war problems. This took the form of a large scale war game or chart exercise in which the participants were given a hypothetical but quite probable war situation, and each operated his national forces in co-operation with other commanders.

On completion of the summer cruise of the Mediterranean Fleet, during which H.M. ships visited Italian, Greek, and Turkish ports, the Fleet in July began a series of exercises to extend throughout the Summer, many of which were to be in conjunction with other navies in the Mediterranean.

The following changes in and additions to the composition of the Mediterranean Fleet were announced on 17th May :—

Aircraft carrier " Ocean," now refitting at Rosyth, to join on completion of trials.

Cruiser " Cleopatra," completing refit at Chatham, to replace the cruiser " Phoebe," recently returned to the United Kingdom.

Destroyer " Cheviot " has been brought forward from reserve at Malta.

Frigate " Cygnet," now refitting at Portsmouth, to replace the frigate " Pelican," which returned to the United Kingdom earlier this year.

Fast minelayer " Manxman," refitting at Chatham, to join shortly.

First Submarine Flotilla to be reinforced by the " Tudor " and " Sanguine "; the " Sentinel " to relieve the " Sturdy ".

East Indies.—On 26th June, the Foreign Secretary, Mr. Morrison, announced in the House of Commons that the cruiser " Mauritius " had been ordered to proceed immediately to the vicinity of Abadan, Persian Gulf. She anchored in Iraqi waters, opposite

Abadan, on the morning of 28th June. It had previously been stated that the frigates " Flamingo " and " Wren " and the tank landing ship " Messina " were in the Persian Gulf. The " Mauritius " was relieved on 21st July by the cruiser " Euryalus," from the Mediterranean.

FAR EAST.—The light fleet carrier " Theseus " returned to Portsmouth on 29th May from the Far East. She had operated in Korean waters since October, 1950, steaming more than 36,000 miles and expending over half a million rounds of cannon shell and machine gun bullets, 6,617 rockets and 1,390 500-lb. bombs against enemy targets. (See " Naval Aviation "). The " Theseus " was replaced in Korean waters by the " Glory."

The frigate " Hart " returned to Devonport on 11th May after six years in the Far East, though not with the same company. She had been employed for many months patrolling in Malayan waters.

WEST INDIES.—The cruiser " Superb," wearing the flag of the Commander-in-Chief, America and West Indies Station, returned to Bermuda at the end of April after a three and a half months' cruise, during which she steamed nearly 16,000 miles and circumnavigated the South American Continent. During one afternoon in southern waters the ship's company sighted more than 500 ice floes. The Presidents of Uruguay, Chile, Peru, and Panama were received on board the ship.

PERSONNEL

PARACHUTE PAY.—An Order in Council of 31st May, published in *The London Gazette* on 1st June, increased the rate of parachute pay for officers and men of the Royal Navy and Royal Marines from 2s. a day to 4s. a day, with effect from 1st September, 1950.

SEAMANSHIP MANUAL.—The first of three volumes of the Admiralty's new " Manual of Seamanship " was announced for publication on 3rd July. The old Manual, though available to the general public through H.M. Stationery Office, was intended primarily for the use of junior officers and men of the Royal Navy. The new volume has a far wider scope, embracing all matters of seamanship, whether Service or otherwise.

CATHEDRAL CHAPEL.—On 2nd June, Admiral of the Fleet Lord Tovey formally reopened the Seamen's Chapel of St. Andrew in Lincoln Cathedral, in memory of Lincolnshire naval and merchant seamen who lost their lives in the 1939–45 War.

MATERIAL

STRENGTH.—In the House of Lords on 11th April, the First Lord of the Admiralty, Lord Hall, said that the full naval programme, together with current construction when completed, would add 232 ships to existing naval strength. These would include fleet carriers, destroyers, and 24 frigates. The number of ships brought into service with the Fleet from reserve would be 60.

GAS TURBINE.—The second gas turbine unit in the Royal Navy, in the 52-ft. dockyard harbour launch No. 3964, has been completed. It is a " Rover " gas turbine weighing 600 lb. in place of a 2½ tons diesel engine. This craft and M.T.B. 5559 (formerly M.G.B. 2009), the first craft powered by a gas turbine unit to go to sea, made a series of demonstration runs in the Thames during the Festival of Britain Gas Turbine Week from 18th to 23rd June. H.L. 3964 will now go into service at Portsmouth.

FLOATING DOCK.—Admiralty Floating Dock No. 5, one of the largest in the world, left Bermuda on 11th July for Falmouth in tow of H.M. tugs " Reward " and " Warden." The voyage was estimated to take 25 days. Lieutenant-Commander Norman Hunter, R.N., commanding the " Reward," was in charge of the operation.

DOVER WRECKS.—The Admiralty announced on 13th July that the boom defence vessel " Barglow " had been brought forward from reserve and manned with a civilian

crew to survey four wrecks lying on the bottom of the Dover Strait. All four are of ships lost during the 1939–45 War, and have been partially dispersed by depth charges.

YACHT "AMARYLLIS."—The Admiralty announced on 30th May that the yacht "Amaryllis," which was sailed round the World between 1920 and 1923 by the late Lieutenant G. H. P. Muhlhauser, R.N.R., and afterwards became a training yacht for cadets of the R.N. College, Dartmouth, was to be sunk off Start Point, in accordance with the understanding that when the Navy had no more use for her she should be sunk.

HOSPITAL SHIP.—The Admiralty has placed an order for a 10,000-ton hospital ship with a Glasgow firm. This will be the first ship of its kind to be specially built for the Royal Navy. The present hospital ship, which like its predecessors is named the "Maine," is the 7,515-ton former Italian liner "Leonardo da Vinci." Since the outbreak of the Korean war she has been doing valuable work in Far Eastern waters.

"BEDENHAM" EXPLOSION.—In a statement in the House of Commons on 2nd May, Mr. W. J. Edwards, Civil Lord of the Admiralty, said that preliminary inquiries into the destruction of the naval armament vessel "Bedenham" on 27th April, at Gibraltar, led to the belief that the explosion was caused by the ignition of a depth charge in the lighter which was moored alongside the vessel. The resulting fire caused ammunition in the lighter to explode and the force of the explosion broke the "Bedenham" in two. Six dockyard employees and four other persons lost their lives. Three locally entered dockyard labourers were missing, presumed dead, and eleven people were known to have been seriously injured.

NAVAL AVIATION

HOME WATERS.—It was announced on 10th May that the seagoing operational and flying training arrangements in home waters are now to be as follows:—H.M.S. "Illustrious" remains as the trials carrier, including trials with the latest jet aircraft in her programme, but will cease to function in her secondary training role. Both deck landing and batsmen training will be concentrated in H.M.S. "Triumph." H.M.S. "Vengeance," temporarily employed on this training during the refit of the "Illustrious," was to join the Home Fleet for full operational duties, and to embark the first all-weather air group, consisting of 809 Squadron with "Sea Hornets" and 814 Squadron with "Fireflies." H.M.S. "Indomitable," with an operational air group embarked, remains flagship of the Home Fleet.

FOUR-YEAR ENTRY SCHEME.—Mr. Callaghan, Parliamentary Secretary, announced in the House of Commons on 20th June the introduction of a four-year entry scheme for naval aviation. The National Service Scheme suffers from the disadvantage that although it is possible to train a pilot or observer in the two years of such service he is no sooner trained than he has to be released. To provide an alternative, young men accepted for training during their National Service may now volunteer to transfer to a short service engagement which will extend their full time service to four years. On their transfer they would receive regular rates of pay. All time after transfer, subject to their having been awarded their wings, would count for gratuity at the rate of £175 a year. At the end of their four-year engagement officers could volunteer for another four years, all of which would count for gratuity at the same rate, and during that period they might be considered for permanent Commissions in the Royal Navy.

BOYD TROPHY AWARD.—On the return to Portsmouth of H.M.S. "Theseus" from the Far East on 29th May, the Boyd Trophy was presented to No. 17 Carrier Air Group by Admiral of the Fleet Lord Fraser. This was in recognition of her service in Korean waters for the period October to December, 1950, when the Air Group flew 2,491 hours in 1,144 sorties during three operational periods, without accident and with an average serviceability for the Group of over 90 per cent. The Boyd Trophy is awarded annually for the finest feat of aviation in the Royal Navy.

NEW JET FIGHTER.—The de Havilland "Sea Venom," a carrier-borne all-weather jet fighter for use by day and night, is now in quantity production for the Royal Navy and will go into service alongside the Hawker "Sea Hawk" and the Supermarine "Attacker," both single-seat jet fighters. The "Sea Venom" is equipped with radar and has a crew of two, pilot and navigator-radar operator.

H.M. SUBMARINE "AFFRAY"

The submarine "Affray," for which continuous search had been made since she failed to surface off Start Point on 17th April, was found on 14th June in a position 37 miles down Channel to the Westward of her reported diving position and about 16 miles North of Alderney, Channel Islands. She was found in 43 fathoms of water in position 49° 49.9′ North, 2° 34.2′ West—67 miles 228° true from St. Catherine's lighthouse. The "Affray" was in normal condition except that her snort device was damaged. All hatches were closed and her indicator buoys were housed. Her hydroplanes were set to rise. All indications tended to confirm the previously expressed Admiralty view that disaster must have overtaken the submarine and her crew very suddenly. The naval diving ship "Reclaim" later recovered the damaged snort and brought it to Portsmouth for examination. A Naval Board of Inquiry was convened by the Commander-in-Chief, Portsmouth, under the presidency of Rear-Admiral R. M. Dick.

On 20th June, it was announced that the fund to assist the dependants of the 75 officers and men in the "Affray" had passed the original target of £100,000 and had been closed.

ROYAL NAVAL VOLUNTEER RESERVE

To bring the Royal Naval Volunteer Reserve still further into line with the Royal Navy, approval has now been given to the allocation of ship names to the twelve R.N.V.R. Divisions. The cap ribbons worn by R.N.V.R. ratings will in future bear the appropriate ship name for the Division to which they are attached, preceded by "H.M.S.," replacing cap ribbons hitherto in use with the letters "R.N.V.R." followed by the name of the Division. The following ship names will be used :—

Ulster—H.M.S. "Caroline"; Sussex—H.M.S. "Sussex"; Tay—H.M.S. "Cressy"; Severn—H.M.S. "Flying Fox"; London—H.M.S. "President"; Forth—H.M.S. "Claverhouse"; Clyde—H.M.S. "Graham"; Solent—H.M.S. "Wessex"; Mersey—H.M.S. "Eaglet"; Humber—H.M.S. "Galatea"; South Wales—H.M.S. "Cambria"; Tyne—H.M.S. "Calliope" or H.M.S. "Northumbria." In the case of the Tyne Division, the ship name to be used has still to be finally decided, but will be one of the two given above.

WOMEN'S ROYAL NAVAL SERVICE

The King has been graciously pleased to approve that Her Royal Highness the Duchess of Kent, Commandant of the Women's Royal Naval Service, shall in future have the title of Chief Commandant in that Service.

The Director of the Women's Royal Naval Service, Miss M. K. Lloyd, O.B.E., will in future hold the rank and title of Commandant, W.R.N.S.

The changes in title were published in *The London Gazette* on 27th April, 1951.

ROYAL MARINES

PROMOTION.—Lieutenant General Sir Leslie C. Hollis, K.C.B., K.B.E., to be General (11th May, 1951).

HALF-YEARLY PROMOTIONS.—The following promotions have been made to date 30th June, 1951 :—

LIEUTENANT-COLONEL TO COLONEL.—W. S. North, C. F. Phillips, D.S.O.,O.B.E.

PROSPECTIVE CHANGES.—On 5th July, the Admiralty announced that the following retirement, promotion, and appointments of senior Royal Marine officers have been approved :—

Major-General J. E. Leech-Porter, C.B., C.B.E., Major-General, Royal Marines, Plymouth, to Retired List on 1st November, 1951.

Major-General W. I. Nonweiler, C.B.E., Chief of Staff to the Commandant General, Royal Marines, to be Major-General, Royal Marines, Plymouth, from 1st November, 1951.

Colonel J. C. Westall, C.B.E., Commanding Royal Marines, Deal, to be Major-General from 1st November, 1951, and to be Chief of Staff to the Commandant General, Royal Marines.

3 COMMANDO BRIGADE.—Brigadier C. F. Phillips, D.S.O., O.B.E., took over command from Brigadier C. R. Hardy, D.S.O., O.B.E., on 12th February, 1951. 3 Commando Brigade completed a year of operations in Malaya in July. The Brigade is operating in Perak, one of the largest States of the Federation. It is roughly the size of Wales, though a good deal more mountainous, some of the peaks being over 7,000 ft., and two-thirds of it being covered with primary jungle. During the year's operations the Brigade have killed 100 bandits and captured 34, while many more have surrendered to them. They themselves have had 4 officers and 11 other ranks killed. For operations in Malaya, 5 Military Crosses, 1 Distinguished Conduct Medal, and 2 Military Medals have been awarded to ranks of the Brigade.

41 INDEPENDENT COMMANDO.—The Commando is still in Japan. In April, the whole unit carried out a raid on the East coast of Korea, with the support of heavy naval gunfire. The objective was easily achieved and no casualties were incurred. For operations in Korea, 1 Distinguished Service Order, 3 Military Crosses, and 9 Military Medals have been awarded to ranks of the Commando.

RAID BY H.M.S. "CEYLON'S" DETACHMENT.—On 20th May, 1951, H.M.S. "Ceylon's" Royal Marines Detachment made a raid behind the enemy lines on the West coast of Korea. They landed in the Chinampo area in daylight, and successfully reconnoitred several villages in the area which had been held in strength by the enemy, penetrating a maximum distance of $1\frac{1}{2}$ miles inland. The landing was preceded by a mine sweeping operation and a sustained bombardment from the cruisers "Ceylon" and "Kenya."

ROYAL TOURNAMENT.—The Royal Marines' part in the Royal Tournament this year was a drill display by the King's Squad. In the competitive events, Sgt. R. G. J. Anderson was Dismounted Champion-at-arms for the third year in succession. The Foil, Sabre, and Bayonet championships were all won by the Corps.

BATTLEFIELD TOUR.—A battlefield tour of the Normandy Beaches, with particular reference to commando operations, was carried out by 50 officers in April. The officers were accommodated in H.M.S. "Suvla" for the duration of the tour.

DOMINION AND COMMONWEALTH NAVIES

CANADA

PROMOTIONS.—The following were included in the half-yearly list announced on 30th June, 1951 :—

Captain to Commodore.—H. S. Rayner, D.S.C.
Commander to Captain.—D. L. Raymond.
Commander (E) to Captain (E).—J. MacGillivray.
Surgeon Captain to Surgeon Commodore.—A. McCallum, O.B.E., V.R.D., M.D.
Constructor Commander to Constructor Captain.—F. Freeborn.
Commander (SB) to Captain (SB).—P. R. Hurcomb.

THE "ATHABASKAN" RETURNS HOME.—The destroyer "Athabaskan" returned to Canada in May after ten months' service in the Korean war zone. Christened by the

Americans the " Little Mo " after her operations in company with the U.S. battleship " Missouri " (the " Mighty Mo "), she steamed over 60,000 miles in naval operations and spent 202 of her 273 days in Korean waters. Commendatory messages were received from Vice-Admiral C. T. Joy, the U.S. Naval Commander-in-Chief, and from Rear-Admiral A. K. Scott-Moncrieff, Commanding the British Commonwealth Fleet.

THE " HURON " COMMENDED.—The destroyer " Huron," which has replaced the " Athabaskan," earned early commendation in June as the first Allied ship to capture a large Communist junk and to return with prisoners. The junk was towed to the nearest Allied base—the first time a ship had returned with the junk as well. Next day, the British frigate " Black Swan " repeated the feat and became the second ship to bring back a junk and prisoners.

AUSTRALIA

PROMOTIONS.—The following were included in the half-yearly list, to date 30th June, 1951 :—

Commander to Captain.—R. Rhoades, D.S.C.

Commander (E) to Captain (E).—J. W. N. Bull.

CARRIER OFFER.—On 11th May, the Admiralty announced that experience had shown that it is desirable to give ships' companies and air crews of carriers a period of rest after six months' service in Korean waters. If the war in Korea continues, H.M.S. " Glory " will thus require some relief in October, and to effect this, while avoiding even a temporary reduction in the British Commonwealth contribution to the United Nations Forces in Korea, the Australian Government has very generously agreed to make H.M.A.S. " Sydney " available for Korean service for three months from October.

On 26th June, Mr. Francis, acting Minister for the Navy, announced that an attempt to damage the " Sydney " and prevent her scheduled departure for Korea had been discovered by the naval authorities in Sydney. One of the ship's radar sets was deliberately damaged, but the job was amateurish and would cause no delay in sailing.

NEW ZEALAND

THE " TUTIRA " RETURNS

The frigate " Tutira " left Korean waters in May for home after ten months' war service. The "Tutira" shared with the other frigates the dull routine of escort and blockade patrol duties. Once she was continuously at sea for 46 days, during which time she was anchored for only six days, refuelling and revictualling at sea. Rear-Admiral Smith, the U.S. Commander of the United Nations Blockading Force, in a farewell message, said : " Your hard-fighting ship has performed its many duties in a highly efficient manner. It has been a pleasure to have had you under my command.

SOUTH AFRICA

BUDGET CRITICISM.—The report of the speech of Mr. L. C. Gay, the Member for Simonstown, printed in the May JOURNAL, which criticized the state of the South African Naval Forces, was at variance with the following statement made by Commodore F. J. Dean, O.B.E., Director General of the South African Naval Forces, which was also referred to during the debate in the House :—

> " The latest reports of the ships ' Natal,' ' Good Hope,' and ' Pietermaritzburg ' are that the engines of two of them are capable of maximum speed once steam is raised, and the third needs repairs which could be carried out in the time it would take to commission her.
>
> " All other ships in reserve are carefully maintained. Hulls are surveyed and all necessary repairs effected. Maintenance includes routine turning of the engines of all ships every week. All ships can be commissioned at short notice."

Writing in the *Natal Mercury* on 11th June, 1951, the paper's shipping reporter stated :—

> " Recently I had the opportunity of going aboard S.A.N.F. reserve ships, whose condition has been criticized in Parliament. The ships are in exceptionally good condition for Reserve Fleet vessels and it is doubtful if laid up fleets of any other Nation in the World can compare with them. Laid up ships are bound to deteriorate to some extent, but the South African Navy is doing everything to keep its reserve ships in the best possible condition."

NEW MARINE CORPS.—It was announced in Pretoria on 1st July that a Marine Corps is to be formed as part of the South African Naval Forces. Arrangements are being made for Royal Marine officers from Britain to assist in the training and building up of the new Corps.

INDIA

PRESIDENT'S COLOURS

President's Colours were presented on 27th May to the Indian Navy at a ceremony at Brabourne Stadium, Bombay. The Navy is the first of the armed forces to receive this distinction, the President's Colours having taken the place of the King's Colours which were laid up last year when India became a republic.

FOREIGN NAVIES

ARGENTINA

NEW ANTARCTIC BASES

Argentina made a new claim to territory in Antarctica with the publication on 30th April in the Official Gazette of a decree signed by President Peron and Admiral Garcia, Minister of Marine, giving the name " Admiral Brown Naval Detachment " to the Argentine naval station situated " at Punta Proa, in Grahamland, in the Argentine Antarctic sector." A preamble to the decree stated that the detachment is a permanent naval station under the Ministry of Marine and that its functions include meteorology.

The British Government protested against the establishment of this base and of another at Margarita Bay. On 1st June, Argentina rejected the protest, declaring that she was acting within her rights and that the new base did not contravene the naval agreement between Britain, Argentina, and Chile, by which the three countries undertook not to send warships south of 60 degrees latitude.

BELGIUM

H.M.S. " READY " TRANSFERRED

H.M.S. " Ready," a minesweeper of the " Algerine " class, was transferred to the Belgian Navy at Portsmouth on 4th July. The ship was formally handed over by Rear-Admiral J. P. L. Reid, Chief of Staff to the Commander-in-Chief, Portsmouth, and was accepted on behalf of the Belgian Ministry of National Defence by Lieutenant-Colonel E. Delelienne, Belgian Military Attaché in London. The " Ready " is the third ship of her class to be transferred to Belgium, the " Liberty " having been handed over in November, 1949, and the " Cadmus " in January, 1950.

NATIONALIST CHINA

UNITED STATES' ASSISTANCE

Major-General William Curtis Chase, who arrived in Formosa on 1st May from Tokyo to take charge of the United States Advisory Group to assist the Chinese Nationalist Government, announced on 15th May that the United States would spend 5,700,000

dollars (£2,030,000) before the end of June on building up the Nationalist Navy. He also said that the policy of neutralization of Formosa was still in effect and was not in any way changed by the presence of a military mission advising the Nationalist Government.

GERMANY

NEW NAVAL FORCE.—It was reported from Bremerhaven on 17th April that the United States is organizing a naval force, manned mainly by Germans, to counter naval units of the Soviet Zone People's Police operating in the Baltic. Four 600-ton minesweepers have been commissioned, with cutters and torpedo boats. The ships, all from the former German Navy, have been refitted. Members of the United States Navy are in charge, but 80 per cent of the crews are former members of the German Navy.

CADETS' TRAINING SHIPS.—It was reported from Antwerp on 1st June that the four-masted barques " Pamir " and " Passat " were to be used for training German cadets. The ships had been towed from England and sold to an Antwerp firm for scrap, but they were later bought by the German Federal Government.

NORWAY

APPOINTMENT OF COMMANDER-IN-CHIEF

Admiral Thore Horve has been appointed to succeed Vice-Admiral Edvard Danielsen as Commander-in-Chief of the Norwegian Fleet from 1st July. Vice-Admiral Danielsen resigned, with his Chief of Staff, in protest against alleged neglect of the Navy in the rearmament programme. His successor, Admiral Horve, who has been Commander-in-Chief before, resigned in March, 1949, after similarly criticizing the Navy Estimates, and became Chief of a new command in North Norway.

PERU

NEW GUNBOATS

The gunboat " Maranon " was launched for the Peruvian Navy at the Thornycroft shipyard at Woolston, near Southampton, on 23rd April. On 28th June, the " Maranon " and her sister ship the " Ucayali " were handed over to the Peruvian Navy at a ceremony attended by the Peruvian Ambassador. The vessels, which were due to leave for Iquitos in July, are Diesel driven and can steam 6,000 miles without refuelling. Each carries a crew of 30.

TURKEY

VISIT TO MALTA

A Turkish naval force, consisting of four destroyers, four minesweepers, and three submarines, under Vice-Admiral Ridvan Koral, left Istanbul on 3rd May for Malta on a five-day visit.

UNITED STATES

SECRETARY OF THE NAVY.—President Truman announced on 28th June the resignation of Mr. Matthews, Secretary of the Navy. He said that Mr. Matthews would be the new American Ambassador to Eire. The post of Secretary of the Navy was filled by Mr. Dan C. Kimball, the Under-Secretary.

SHIPS FROM RESERVE.—On 15th July, the Navy Department announced that the 45,000-ton battleship " Iowa " and two carriers of the " Essex " class were being taken out of reserve and put on " standby status " ready for quick use. The three other battleships of the " Iowa " class, the " Missouri," " New Jersey " and " Wisconsin," are all in commission.

ARMY NOTES

H.M. The King

The Princess Elizabeth, Duchess of Edinburgh, as Colonel of the Regiment, inspected the 3rd Battalion, Grenadier Guards, at Chelsea Barracks, on 16th May.

The Princess Elizabeth, Duchess of Edinburgh (Colonel, Grenadier Guards), on behalf of The King, presented Colours to the 3rd Battalion, Grenadier Guards, in the Garden of Buckingham Palace on 25th May.

The Princess Elizabeth, Duchess of Edinburgh (Colonel, Grenadier Guards), on behalf of His Majesty, was present at The King's Birthday Parade on Horse Guards Parade on 7th June, and took the Salute. Her Royal Highness was accompanied by The Duke of Gloucester (Colonel, Scots Guards), Personal Aide-de-Camp to The King.

The Princess Elizabeth, Duchess of Edinburgh, was present at the laying up of the old Colours of the 3rd Battalion, Grenadier Guards, at Manchester Cathedral, on 21st June.

Queen Mary witnessed the London District Tattoo on Horse Guards Parade on 14th July.

The Duke of Gloucester (Colonel-in-Chief, The Rifle Brigade) unveiled the Green Jackets War Memorial at Calais on 2nd June.

The Duke of Gloucester (Colonel, Scots Guards), on behalf of The King, presented new Colours to the 1st and 2nd Battalions, Scots Guards, in the Garden of the Palace of Holyroodhouse, Edinburgh, on 28th June.

The Princess Royal (Colonel-in-Chief, Royal Corps of Signals), inspected the 51st (Highland) Infantry Divisional Signal Regiment (T.A.) at Fonthill Barracks, Aberdeen, on 19th June.

The Princess Royal (Controller Commandment of the Women's Royal Army Corps) took the Salute at the Passing Out Parade of Officer Cadets at the Women's Royal Army Corps School of Instruction, Huron Camp, Hindhead, on 5th July.

The Princess Royal (Colonel-in-Chief of the Regiment) presented new Colours to the 1st Battalion, The West Yorkshire Regiment, at Spittal in the British Zone, Austria, on 27th July.

To be Aide-de-Camp General to the King.—General Sir Frank E. W. Simpson, K.C.B., K.B.E., D.S.O., late R.E. (31st January, 1951), vice General Sir John T. Crocker, G.C.B., K.B.E., D.S.O., M.C., tenure expired.

To be Aides-de-Camp to the King.—Brigadier W. J. F. Eassie, C.B.E., D.S.O., late R.A.S.C. (22nd February, 1951), vice Brigadier J. E. Witt, C.B.E., M.C., promoted; Brigadier G. D. Holmes, O.B.E., late R.A. (1st May, 1951), vice Brigadier E. N. Crosse, C.B.E., M.C., retired; Brigadier Sir Millis R. Jefferis, K.B.E., M.C., late R.E. (24th May, 1951), vice Brigadier H. T. S. King, O.B.E., retired; Colonel (acting Brigadier) D. I. Crawford, D.S.O., T.D., R.A., (T.A.) (11th June, 1951), vice Colonel (honorary Brigadier) E. E. F. Baker, C.B.E., D.S.O., M.C., T.D. (retired), tenure expired; Lieut.-Colonel (acting Brigadier) D. V. Phelps, T.D., R.A., (T.A.) (11th June, 1951), vice Colonel (honorary Brigadier) G. Shenstone, C.B.E., T.D. (retired), tenure expired.

To be Honorary Dental Surgeons to the King.—Major-General J. Wren, F.D.S., late R.A.D.C. (13th January, 1951), vice Colonel B. E. Gentleman, retired; Colonel W. L. Pearson, late R.A.D.C. (23rd January, 1951), vice Colonel S. H. Woods, C.B.E., F.D.S., retired; Colonel J. L. Gibson, late R.A.D.C. (5th March, 1951), vice Major-General H. J. Higgins, O.B.E., F.D.S., retired.

To be Colonels Commandment.—Of the Royal Army Medical Corps, Major-General J. C. A. Dowse, C.B., C.B.E., M.C., M.B. (retired) (27th November, 1950), vice Major-General O. W. McSheehy, C.B., D.S.O., O.B.E., M.B., resigned; Major-General J. M.

Macfie, C.B., C.B.E., M.C., M.B., K.H.S. (26th April, 1951), vice Major-General R. E. Barnsley, C.B., M.C., M.B., tenure expired; and Major-General K. R. M. Tomory, C.B., O.B.E., M.B., K.H.P. (1st July, 1951), vice Lieut.-General Sir William P. MacArthur, K.C.B., D.S.O., O.B.E., M.D., D.Sc., F.R.C.P., F.R.C.P.I. (retired), resigned; of the Royal Army Ordnance Corps, Major-General G. T. W. Horne, C.B., C.B.E. (retired) (10th June, 1951), vice Major-General K. M. Body, C.B., C.M.G., O.B.E., tenure expired.

To be Colonels of Regiments.—Of the Royal Horse Guards, Major-General Sir Richard Howard-Vyse, K.C.M.G., D.S.O. (18th May, 1951), vice the late Field-Marshal the Lord Birdwood, G.C.B., G.C.S.I., G.C.M.G., G.C.V.O., C.I.E., D.S.O., D.C.L., Ll.D.; of the 12th Royal Lancers (Prince of Wales's), General Sir Richard L. McCreery, G.C.B., K.B.E., D.S.O., M.C. (18th May, 1951), vice the late Field-Marshal the Lord Birdwood, G.C.B., G.C.S.I., G.C.M.G., G.C.V.O., C.I.E., D.S.O., D.C.L., Ll.D.

Army Council

The King has been pleased by Letters Patent under the Great Seal bearing the date 4th May, 1951, to appoint the following to be His Majesty's Army Council:—

Wing-Commander the Right Honourable E. J. St. L. Strachey—*President.*
Major W. L. Wyatt—*Vice-President.*
Field-Marshal Sir William J. Slim, G.C.B., G.B.E., D.S.O., M.C.
General Sir John T. Crocker, G.C.B., K.B.E., D.S.O., M.C., A.D.C.
General Sir G. Ivor Thomas, K.C.B., K.B.E., D.S.O., M.C.
Lieut.-General Sir Nevil C. D. Brownjohn, K.C.B., C.M.G., O.B.E., M.C.
Lieut.-General Sir John F. M. Whiteley, K.C.B., C.B.E., M.C.
Sir George W. Turner, K.C.B., K.B.E.

Honours and Awards

King's Birthday Honours.—The following were included in the King's Birthday Honours List, published on 7th June, 1951:—

G.C.B.—General Sir John Harding, K.C.B., C.B.E., D.S.O., M.C., A.D.C.

K.C.B.—General Sir Gerald W. R. Templer, K.B.E., C.B., C.M.G., D.S.O.

C.B.—Brigadier B. C. Davey, C.B.E.; Brigadier C. L. B. Duke, M.C.; Major-General C. E. A. Firth, C.B.E., D.S.O.; Major-General G. F. Johnson, C.B.E., D.S.O.; Major-General S. W. Joslin, C.B.E., M.A., M.I.Mech.E., M.I.E.E.; Major-General J. M. MacFie, C.B.E., M.C., M.B., K.H.S.; Major-General R. L. Scoones, D.S.O., O.B.E.; Major-General G. O'C Scott, C.B.E.; Major-General S. N. Shoosmith, D.S.O., O.B.E.; Brigadier E. K. G. Sixsmith, C.B.E.; Major-General G. A. N. Swiney, C.B.E., M.C.; Major-General (temporary) M. M. Alston-Roberts-West, D.S.O.; Major-General P. N. White, C.B.E.

K.C.V.O.—Major M. E. Adeane, C.B., M.V.O., Coldstream Guards.

G.B.E.—General Sir Neil M. Ritchie, K.C.B., K.B.E., D.S.O., M.C., A.D.C.

K.B.E.—Lieut.-General C. F. Loewen, C.B., C.B.E., D.S.O.; Lieut.-General E. A. B. Miller, C.B., D.S.O., M.C.; Major-General C. M. Smith, C.B., C.B.E., M.C., A.M.I. Mech.E. (now retired).

Royal Red Cross First Class.—Major Dorothy O. Wakeham, A.R.R.C., Queen Alexandra's Royal Army Nursing Corps.

Presidential Citation.—The following is the text of the Citation by the President of the United States of America awarded The Gloucestershire Regiment and Troop C, 170th Independent Mortar Battery, Royal Artillery, as public evidence of deserved honour and distinction:—

"The 1st Battalion, Gloucestershire Regiment, British Army, and Troop C, 170th Independent Mortar Battery, Royal Artillery, attached, are cited for exceptionally outstanding performance of duty and extraordinary heroism in action against the armed enemy near Solmari, Korea, on the 23rd, 24th and 25th April, 1951.

"The 1st Battalion and Troop C were defending a very critical sector of the battle front during a determined attack by the enemy. The defending units were overwhelmingly outnumbered. The 83rd Chinese Communist Army drove the full force of its savage assault at the positions held by the 1st Battalion, Gloucestershire Regiment, and attached unit. The route of supply ran South-East from the Battalion between two hills. The hills dominated the surrounding terrain North-West to the Imjin River. Enemy pressure built up on the Battalion front during the day, 23rd April.

"On the 24th April, the weight of the attack had driven the right flank of the Battalion back. The pressure grew heavier and heavier and the Battalion and attached unit were forced into a perimeter defence on Hill 235. During the night heavy enemy forces had by-passed the staunch defenders and closed all avenues of escape. The courageous soldiers of the Battalion and attached unit were holding the critical route selected by the enemy for one column of the general offensive designed to encircle and destroy I Corps.

"These gallant soldiers would not retreat. As they were compressed tighter and tighter in their perimeter defence they called for close-in air strikes to assist in holding on. Completely surrounded by tremendous numbers these indomitable resolute and tenacious soldiers fought back with unsurpassed fortitude and courage. As ammunition ran low and the advancing hordes moved closer and closer, these splendid soldiers fought back viciously to prevent the enemy from over-running the position and moving rapidly to the South.

"Their heroic stand provided the critically needed time to regroup other I Corps units and block the Southern advance of the enemy. Time and again efforts were made to reach the Battalion but the enemy strength blocked each effort. Without thought of defeat or surrender this heroic force demonstrated superb battlefield courage and discipline. Every yard of ground they surrendered was covered with enemy dead until the last gallant soldier of the fighting Battalion was overpowered by the final surge of the enemy masses.

"The 1st Battalion, Gloucestershire Regiment, and Troop C, 170th Independent Mortar Battery, displayed such gallantry, determination and esprit de corps in accomplishing their mission under extremely difficult and hazardous conditions as to set them apart and above other units participating in the same battle. Their sustained brilliance in battle, their resoluteness and extraordinary heroism, are in keeping with the finest traditions of the renowned military forces of the British Commonwealth and reflect credit on these courageous soldiers and their homeland."

Appointments

Tower of London.—Major-General (honorary Lieut.-General) Sir Ronald MacK. Scobie, K.B.E., C.B., M.C., has been appointed Lieutenant of the Tower of London in succession to Lieut.-General Sir Arthur F. Smith, K.C.B., K.B.E., D.S.O., M.C.

War Office.—Major-General W. O. Bowen, C.B., C.B.E., M.I.E.E., appointed Director of Signals (December, 1951).

The Reverend V. J. Pike, C.B.E., M.A., K.H.C., appointed Chaplain-General to the Forces (6th November, 1951).

United Kingdom.—Colonel (temporary Brigadier) R. W. Goodbody, D.S.O., appointed Commander, 56th Armoured Division (T.A.), with the temporary rank of Major-General (30th April, 1951). (Substituted for the notification in the May, 1951, Journal.)

Major-General L. K. Lockhart, C.B., C.B.E., M.C., appointed Commander, East Anglian District (1st May, 1951).

Major-General C. E. A. Firth, C.B.E., D.S.O., appointed Commander, Salisbury Plain District (1st May, 1951).

Colonel (temporary Brigadier) B. A. Coad, C.B.E., D.S.O., appointed Commander, 2nd Infantry Division, with the temporary rank of Major-General (2nd July, 1951). (Substituted for the notification in the May, 1951, Journal).

Brigadier B. C. Davey, C.B.E., appointed Commandant, Military College of Science, with the temporary rank of Major-General (August, 1951).

Colonel (temporary Brigadier) C. L. Firbank, D.S.O., appointed Commander, South-West District and 43rd (Wessex) Infantry Division (T.A.), with the temporary rank of Major-General (September, 1951).

Major-General G. K. Bourne, C.B., C.B.E., appointed Commander, 16th Airborne Division (November, 1951).

Major-General G. W. E. Heath, C.B., C.B.E., D.S.O., M.C., appointed President, Regular Commissions Board (December, 1951).

Colonel (temporary Brigadier) R. P. Harding, D.S.O., appointed Commander, North Midland District and 49th Armoured Division (T.A.) (December, 1951).

GERMANY.—Major-General A. D. Ward, C.B., C.B.E., D.S.O., appointed Commander, I Corps, with the temporary rank of Lieut.-General (18th June, 1951).

Major-General C. F. C. Coleman, C.B., D.S.O., O.B.E., appointed G.O.C. (British Sector) British Troops, Berlin (October, 1951).

MIDDLE EAST LAND FORCES.—Colonel (temporary Brigadier) G. C. Humphreys, C.B.E., appointed Major-General Administration, with the temporary rank of Major-General (7th June, 1951). (Substituted for the notification in the May, 1951, Journal).

Brigadier M. S. Wheatley, C.B.E., A.M.I.E.E., appointed Chief Signal Officer, with the temporary rank of Major-General (November, 1951).

MALTA.—Brigadier W. E. G. Hemming, C.B.E., appointed G.O.C., Malta Garrison, with the temporary rank of Major-General (October, 1951).

GREECE.—Colonel (temporary Brigadier) L. E. C. M. Perowne, C.B.E., A.M.I.E.E., appointed Commander, British Military Mission to Greece, with the temporary rank of Major-General (22nd May, 1951).

KOREA.—Major-General A. J. H. Cassels, C.B., C.B.E., D.S.O., appointed G.O.C. 1st (Commonwealth) Division (10th June, 1951).

SPECIAL EMPLOYMENT.—Colonel (temporary Brigadier) S. A. Cooke, O.B.E., with the temporary rank of Major-General (1st April, 1951); General Sir A. F. Andrew Thorne, K.C.B., C.M.G., D.S.O. (retired pay) (23rd May, 1951).

PROMOTIONS

Lieut.-Generals.—Major-Generals to be Lieut.-Generals:—L. G. Whistler, C.B., D.S.O. (10th May, 1951); C. B. Callender, C.B., M.C. (14th May, 1951).

Major-General to be temporary Lieut.-General.—A. D. Ward, C.B., C.B.E., D.S.O. (18th June, 1951).

Major-Generals.—Temporary Major-Generals, Brigadiers or Colonels to be Major-Generals:—M. M. Alston-Roberts-West, D.S.O. (10th May, 1951); J. H. N. Poett, D.S.O. (14th May, 1951); M. Lea-Cox, C.B.E. (19th May, 1951); L. E. Cutforth, C.B.E. (25th May, 1951); F. R. H. Mollan, C.B., O.B.E., M.C., K.H.S. (26th June, 1951).

Brigadiers or Colonels to be temporary Major-Generals.—S. A. Cooke, O.B.E. (1st April, 1951); M. Lea-Cox, C.B.E. (7th April, 1951), substituted for the notification in the May, 1951 JOURNAL; R. W. Goodbody, D.S.O. (30th April, 1951); H. C. Phipps, C.B., D.S.O. (1st May, 1951); C. P. Jones, C.B.E., D.S.O. (1st May, 1951); L. E. C. M. Perowne, C.B.E., A.M.I.E.E. (22nd May, 1951); G. C. Humphreys, C.B.E. (7th June, 1951); C. J. G. Dalton, C.B.E. (16th June, 1951); B. A. Coad, C.B.E., D.S.O. (2nd July, 1951); J. C. Walkley, C.B.E. (5th July, 1951); W. J. F. Eassie, C.B.E., D.S.O., A.D.C. (15th July, 1951).

REVERSION TO RETIRED PAY

General Sir A. F. Andrew N. Thorne, K.C.B., C.M.G., D.S.O. (18th April, 1951).

Retirements

The following General Officers have retired :—Major-General Sir Douglas D. Gracey, K.C.B., K.C.I.E., C.B.E., M.C. (29th April, 1951), with the honorary rank of General; Major-General G. T. W. Horne, C.B., C.B.E. (19th May, 1951); Major-General M. N. Dewing, C.B., C.B.E., D.S.O. (29th May, 1951); Major-General T. B. Rawlins, C.B., C.B.E., D.S.O., M.C. (17th June, 1951); Major-General D. Dunlop, C.B., C.B.E. (13th July, 1951); Major-General G. M. Elliot, C.B., C.B.E., D.S.O., M.C. (28th July, 1951).

Chief of the Imperial General Staff

Extension of Appointment

The War Office has announced that the King has approved the extension of the appointment of the Chief of the Imperial General Staff, Field-Marshal Sir William Slim, until 1st November, 1952.

Commonwealth Division

The Secretary of State for Commonwealth Relations announced in the House of Commons on 1st May the linking together of United Kingdom, Canadian, Australian, New Zealand, and Indian contingents serving in Korea to form the 1st (Commonwealth) Division, United Nations Forces.

He said that the formations and units concerned were the 28th and 29th United Kindom Infantry Brigades; the 25th Canadian Infantry Brigade; the 3rd Battalion, Royal Australian Regiment; the 16th Field Regiment, Royal New Zealand Artillery; and the 60th Indian Field Ambulance. He added that it was also hoped to contribute Royal New Zealand Army Service Corps and Electrical and Mechanical Engineer elements to the make up of the extra divisional troops required.

Staff College, Camberley

A list of the officers who qualified in the Staff College entrance examination held in February, 1951, was published in *The Times* of 18th June.

Regular Army Commissions

On 13th June, the War Office announced details of a new scheme for Regular Army commissions.

Permanent Regular commissions in most arms of the service are offered to ex-officers who have held Regular or non-Regular commissions in the Army, Navy or Air Force. Applicants with the necessary educational qualifications may select the arm in which they wish to serve, whether or not they have served in that arm before.

For R.E.M.E., candidates of 26 years of age or over must hold a science degree or have passed the graduate examination of the Institute of Electrical Engineers or the Institute of Mechanical Engineers. Under 26, they must have the inter-B.Sc. The Royal Engineers and Royal Signals require matriculation with credits in mathematics and physics.

Applicants for the Royal Artillery, Royal Signals or the Infantry must have been born after 1st January, 1923. In all other cases the earliest date of birth acceptable is 1st January, 1921, although the Royal Engineers may consider exceptionally well qualified candidates above this age.

Re-Employment for Retired Officers

The War Office are inviting retired Regular officers, including those who served in the Indian Army, to come back as civilians in a limited number of static military appointments. Salaries, which will be paid in addition to any retired pay which officers may be receiving, will vary between £620 and £800 per annum according to the grade of the appointment and the location.

Retired Regular officers are eligible to be considered for these appointments if they are at least 42 but under 58 years of age. Applications should be made through Appointments Offices of the Ministry of Labour and National Service.

Moves and Reliefs

The King's Shropshire Light Infantry.—The King's Shropshire Light Infantry embarked at Hong Kong for Korea on 8th May.

16th Independent Parachute Brigade Group.—The 16th Independent Parachute Brigade Group sailed from Portsmouth on 4th June in the aircraft carriers "Triumph" and "Warrior" for Cyprus where, it was stated, it would be stationed for at least a year. The Brigade Group arrived in Cyprus on 12th June. The 33rd (Airborne) Light Regiment, R.A., embarked at Liverpool on 5th June and arrived in Cyprus on 16th June.

6th Armoured Division.—It was reported on 9th May that the 6th Armoured Division is being sent to Western Germany. No date for this move was given.

Relief of Units of 29th Brigade in Korea.—Arrangements are being made for all units of the 29th Brigade to be relieved separately between October and December, 1951. The 8th Hussars will be returning to the United Kingdom for service later in Germany. The 45th Field Regiment, 11th L.A.A. Battery and 170th Light Battery, R.A., will be moving to Hong Kong. Of the three infantry battalions, only The Gloucestershire Regiment will return direct to the United Kingdom. The Royal Northumberland Fusiliers will be staged at Hong Kong until relieved and will then return to the United Kingdom, probably by March, 1952. The Royal Ulster Rifles will remain in the Far East, outside Korea, to complete a full overseas tour.

Women's Royal Army Corps

Opening of Staff College

A staff college for the Women's Royal Army Corps at Frimley Park, near Camberley, was opened on 6th July by the Adjutant-General, General Sir John T. Crocker.

London District Tattoos

London District again arranged to hold Tattoos on Horse Guards Parade, and these took place on every Wednesday and Saturday evening in July, when weather permitted. The Tattoos started at 7.30 p.m., and lasted for approximately an hour and twenty minutes. Each Tattoo consisted of seven of the following items:—

The Musical Ride by the Household Cavalry.

The Musical Drive by The King's Troop, Royal Horse Artillery.

The Trumpeters of the Household Cavalry, The King's Troop, Royal Horse Artillery, or The Royal Military School of Music.

Armoured Cars of The Life Guards.

Massed Bands of the Brigade of Guards.

Massed Pipes and Drums of the Brigade of Guards.

The Band of the Boys' Battery, Royal Artillery.

A Trick Ride of motor cyclists from either the 56th Armoured Division Signal Regiment (T.A.), or the 23rd(S) Corps Signal Regiment (T.A.), or the 23rd(S) Corps Provost Company (T.A.).

Assembly of a Jeep from its component parts by units of the Royal Electrical Mechanical Engineers.

In addition there was a Finale composed of a number of the above units.

Music was provided by a Static Band found in turn by the Bands of The Life Guards, Royal Horse Guards, Royal Artillery and The Royal Military School of Music.

War Memorials

The King's Shropshire Light Infantry and the Herefordshire Regiment.—During a service in St. Chad's Church, Shrewsbury, on 10th June, to commemorate the Battle of Bligny (6th June, 1918), a Memorial to the officers and men of The King's

Shropshire Light Infantry and The Herefordshire Regiment (now The Herefordshire Light Infantry) was dedicated by the Bishop of Lichfield (Dr. Woods).

GREEN JACKETS' WAR MEMORIAL IN CALAIS.—On 2nd June, at Calais, the Duke of Gloucester, Colonel-in-Chief The Rifle Brigade, unveiled and Canon F. Ll. Hughes, Chaplain-General to the Forces, assisted by the Rev. R. G. Heard, who was the regimental chaplain of Queen Victoria's Rifles at the defence of Calais, dedicated the Green Jackets' War Memorial in honour of the officers and other ranks of the 2nd Battalion The King's Royal Rifle Corps, the 1st Battalion, The Rifle Brigade, and the 1st Battalion Queen Victoria's Rifles (T.A.), who died in the defence of the town between 23rd and 26th May, 1940.

PUNJAB FRONTIER FORCE.—On 3rd June, the Bishop of London dedicated a chapel at St. Luke's Church, Chelsea, in memory of officers of The Punjab Frontier Force who lost their lives on active service or died between 1846 and 1947. He also dedicated in the crypt Memorial Tablets brought to England in 1947 from churches at Kohat, Mardan, and Abbottabad.

MISCELLANEOUS

TROOPS FLOWN TO ANTIGUA.—On 14th June, a detachment of the Royal Welch Fusiliers was flown from Jamaica to Antigua in answer to a call by the Governor for military reinforcements in face of local disorders.

BISLEY, 1951.—R.Q.M.S. G. Armstrong, 3rd Battalion Grenadier Guards, won the British Army rifle championship; Major R. M. Parsons, the winner in 1949 and 1950, was second. The Territorial Army Championship was won by Captain J. Hamill, 470th H.A.A. Regiment, Royal Artillery (T.A.). Allhallow's School won the Ashburton Shield, St. Paul's were second and Marlborough third; teams from 79 schools took part.

DOMINIONS AND COLONIES

CANADA

APPOINTMENTS.—Major-General N. E. Rodger, C.B.E., C.D., will become G.O.C. Prairie Command in December, 1951, on his return from the Imperial Defence College in England, in succession to Brigadier R. E. A. Morton, D.S.O., C.D., who has been selected to attend the next course at the National Defence College at Kingston which begins on 10th September. Prairie Command will be commanded by Brigadier Connelly, C.B.E., C.D., during the intervening period.

STAFF COLLEGE, KINGSTON.—Seventy-eight Canadian Army officers have been selected to attend the forthcoming course at the Canadian Army Staff College at Kingston. Five more will attend the next courses at staff colleges in England, Australia, India, and Pakistan.

25TH CANADIAN INFANTRY BRIGADE REPLACEMENT GROUP.—This Replacement Group moved from Fort Lewis, Washington, to Wainwright, Alberta, in mid-May.

27TH CANADIAN BRIGADE GROUP.—Recruiting for this Brigade Group, which is being raised for service in Europe, commenced on 7th May.

REGIMENTAL ALLIANCE.—The King has approved the alliance between The Windsor Regiment (22nd Reconnaissance Regiment), Royal Canadian Armoured Corps, and the 3rd Carabiniers (Prince of Wales's Dragoon Guards).

SHORT SERVICE COMMISSIONS.—It was announced in Ottawa on 7th May, by the Defence Minister, Mr. Brooke Claxton, that single men between the ages of 18 and 25, without military experience, are eligible for short service commissions in the Canadian Army Active Force under the terms of a new officer procurement plan. Minimum academic requirement is junior matriculation or its equivalent. This new plan involves a continuous one year training programme divided into five phases. The first group was scheduled to commence training on 21st May.

RESERVE FORCE TRAINING.—Some 6,000 Reserve Force soldiers were expected at Camp Petawawa for field training during June, July, and August. In all, ten camps throughout Canada will handle some 11,000 reservists this Summer.

CANADIAN WOMEN'S ARMY CORPS.—The Canadian Army began recruiting women for certain units of the Reserve Force on 22nd June.

BISLEY.—Lieutenant Gilmour S. Boa, a reservist in the 48th Highlanders of Canada, won the King's Prize and the National Rifle Association's gold medal and gold badge.

AUSTRALIA

RECRUITS FROM GREAT BRITAIN

By the end of June, 933 men had been attested in Britain for the Australian Army, of whom 572 had already arrived in Australia.

PAKISTAN

NEW CHIEF OF STAFF AND ADJUTANT-GENERAL

It was announced in Karachi on 2nd May that Major-General Nasir Ali Khan had been appointed Chief of Staff of the Pakistan Army, with the rank of Lieut.-General, in succession to Lieut.-General Ross McCay who had been appointed adviser to the Commander-in-Chief, Pakistan Army.

It was also announced that Major-General Nawabzada Sher Ali Khan had been appointed Adjutant-General of the Pakistan Army.

EAST AFRICA

BATTALIONS FOR MALAYA

The 1st (Nyasa) and 3rd (Kenya) Battalions of the King's African Rifles are being sent to Malaya to assist during the emergency. They will be ready to sail early next January. They will be replaced in East and Central African territories by two new battalions, one in Kenya to be known as the 23rd (Kenya) Battalion, the other in Tanganyika to be called the 26th (Tanganyika) Battalion.

FOREIGN

UNITED STATES

ARRIVAL OF REINFORCEMENTS IN GERMANY.—The first ships to bring United States Army reinforcements on a large scale to Western Germany arrived at Bremershaven at the end of May. They contained units of the 4th Infantry Division.

RECRUITMENT OF DISPLACED PERSONS.—The United States Army Headquarters in Heidelberg announced on 25th March that displaced persons in Western Germany, and persons who had fled from " Iron Curtain " countries, could offer themselves for enlistment in the United States Army to the number of 2,500. It was laid down that German nationals and citizens of countries participating in the E.R.P. or the North Atlantic Treaty would be ineligible for enlistment; that only unmarried men between the ages of 18 and 33 would be considered; that applicants would be carefully screened and would be expected to possess sufficient command of English to absorb training; and that enlistment would be for a five-year period, the applicants accepted being sent to the United States for training immediately after acceptance.

AIR NOTES

H.M. The King

The Princess Elizabeth, Duchess of Edinburgh, on behalf of His Majesty, presented The King's Colour to the Royal Air Force in the United Kingdom at a representative Parade in Hyde Park on 26th May.

The Queen, Queen Mary, the Princess Margaret, the Duke and Duchess of Gloucester, the Princess Royal and the Duchess of Kent were present.

The Secretary of State for Air, the Right Hon. Arthur Henderson, M.P.; the Chief of the Air Staff, Marshal of the Royal Air Force Sir John Slessor; the Vice-Chief of the Air Staff, Air Chief Marshal the Hon. Sir Ralph Cochrane, Air Aide-de-Camp to The King; other Members of the Air Council; the Air Officer Commanding-in-Chief, Fighter Command, Air Marshal Sir Basil Embry; and the Air Officer Commanding-in-Chief, Technical Training Command, Air Marshal Sir John Whitworth Jones, were also present.

The Princess Elizabeth was received with a Royal Salute, followed by a Fly-Past of four Wings of Fighters (1 Vampire, 3 Meteors).

Her Royal Highness, attended by Air Commodore R. N. Waite, Parade Commander, Air Chief Marshal the Hon. Sir Ralph Cochrane and Group Captain Peter Townshend, inspected the Parade.

After the inspection, the Colour was consecrated by the Reverend Canon L. Wright, Chaplain-in-Chief, Royal Air Force. On conclusion of this ceremony, the Colour was handed to Princess Elizabeth by Group Captain H. J. Pringle. Her Royal Highness then presented the Colour to Flying Officer D. Mullarkey, Officer of the Colour.

The Princess Elizabeth addressed the Parade. She spoke of The King's regret that, because of illness, he was unable to be present himself, and said that he had asked her to read the following address on his behalf:—

"I am very glad to present my Colour to-day to the Royal Air Force in the United Kingdom. Your Service was formed during the reign of my father, King George V, and I myself have had the closest ties with the Royal Air Force since its formation in 1918. I have watched with the keenest admiration how it has grown up from those early days to prove in every way worthy of its place alongside the older Services.

"During the dark days of 1940, when my people stood alone to defend the cause of freedom, the Royal Air Force played the foremost part in turning the tide which led to ultimate victory. Your duties at all times call for high qualities of endurance and skill, to which must be added the dash and zest of youth.

"The courage and determination which have marked your achievements in war have been matched in this quiet heroism by many feats of daring and enterprise that your Service has been called upon to perform in times of peace. The great traditions of the Royal Air Force have been established through unflinching devotion to duty, and I am deeply conscious of the many gallant young lives which have been laid down not only in conflict with the enemy but in facing the many hazards which are in the very nature of your ordinary duties.

"I now hand over this King's Colour confident that you will honour it as the emblem of your achievements and the shrine of your Service traditions. Let it be a reminder to you of the devotion and sacrifices of your predecessors and a symbol of the trust, which I repose in the Royal Air Force."

The Parade Commander replying to The King's Address said that the Royal Air Force would cherish and honour the Colour and endeavour worthily to uphold the traditions of their predecessors.

The Colour was then given the General Salute and marched in slow time by the Colour Party to its position in front of the Escort Squadron. The Escort Squadron re-formed line and marched past Her Royal Highness first in slow time, then in quick

time, and finally advanced in Review Order. After the Royal Salute, three cheers were given for the Princess by the whole Parade.

The King and Queen, accompanied by Princess Margaret, flew from London Airport to Dyce on 13th May in a Vickers Viking of the King's Flight. This was the first occasion upon which The King and Queen had flown together in the same aircraft since their accession to the Throne.

Ninety-six jet fighters (24 Vampires and 72 Meteors) from Fighter Command and the Royal Canadian Air Force flew past Buckingham Palace on 7th June, in honour of the official anniversary of The King's Birthday.

With the approval of The King, the Princess Elizabeth, Duchess of Edinburgh, has graciously accepted the appointment as Honorary Air Commodore of the No. 603 (City of Edinburgh) Squadron, Royal Auxiliary Air Force; No. 2603 (City of Edinburgh) Squadron, Royal Auxiliary Air Force Regiment and No. 3603 (City of Edinburgh) Fighter Control Unit, Royal Auxiliary Air Force.

Honours and Awards

The following awards were included in the King's Birthday Honours :—

K.C.B.—Air Chief Marshal Sir William Elliot, K.B.E., C.B., D.F.C., A.D.C. ; Air Chief Marshal Sir George C. Pirie, K.B.E., C.B., M.C., D.F.C., LL.D. ; Air Chief Marshal Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C.

K.B.E.—Air Marshal R. Ivelaw-Chapman, C.B., C.B.E., D.F.C., A.F.C. ; acting Air Marshal J. N. Boothman, C.B., D.F.C., A.F.C.

C.B.—Air Vice-Marshal T. G. Bowler, C.B.E. (retired) ; Air Vice-Marshal N. H. D'Aeth, C.B.E. ; Air Vice-Marshal S. D. Macdonald, C.B.E., D.F.C. ; Air Commodore O. W. de Putron, C.B.E., A.D.C. ; Air Commodore A. McKee, C.B.E., D.S.O., D.F.C., A.F.C. ; Air Commodore W. Wynter-Morgan, C.B.E., M.C.

Appointments

Air Ministry.—Air Vice-Marshal J. MacC. Kilpatrick, O.B.E., M.B., B.Ch., D.P.H., appointed Director-General of the Royal Air Force Medical Services (1st July, 1951).

Inspectorate-General.—Air Marshal Sir Thomas M. Williams, K.C.B., O.B.E., M.C., D.F.C., appointed Inspector-General of the Royal Air Force (July, 1951).

Coastal Command.—Air Vice-Marshal A. C. Stevens, C.B., appointed Air Officer Commanding-in-Chief, Coastal Command with the acting rank of Air Marshal (8th June, 1951).

Fighter Command.—Air Commodore the Earl of Bandon, C.B., D.S.O., appointed Air Officer Commanding No. 11 Group with the acting rank of Air Vice-Marshal (5th July, 1951).

Flying Training Command.—Air Commodore A. McKee, C.B., C.B.E., D.S.O., D.F.C., A.F.C., appointed Air Officer Commanding No. 21 Group with the acting rank of Air Vice-Marshal (6th July, 1951).

No. 90 Group.—Air Vice-Marshal W. E. Theak, C.B., C.B.E., appointed Air Officer Commanding No. 90 Group (June, 1951).

Staff College.—Air Commodore A. D. Gillmore, C.B.E., appointed Commandant of the Royal Air Force Staff College with the acting rank of Air Vice-Marshal (18th June, 1951).

Middle East Air Force.—Air Vice-Marshal J. A. Gray, C.B., C.B.E., D.F.C., G.M., appointed Air Officer in charge of Administration (June, 1951).

Air Commodore V. S. Ewing, C.B.E., M.B., B.Ch., D.P.H., appointed Principal Medical Officer with the acting rank of Air Vice-Marshal (June, 1951).

BRITISH JOINT SERVICES MISSION, U.S.A.—Air Vice-Marshal J. D. Breakey, C.B., D.F.C., appointed Head of the Air Force Staff, British Joint Services Mission, Washington.

U.K. LIAISON STAFF, AUSTRALIA.—Air Vice-Marshal G. Harcourt-Smith, C.B., C.B.E., M.V.O., appointed Head of the United Kingdom Service Liaison Staff, Australia.

PROMOTIONS

GENERAL DUTIES BRANCH. *Air Marshal to be Air Chief Marshal.*—Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C. (15th May, 1951 and with seniority of 1st April, 1951).

Air Vice-Marshal (acting Air Marshal) to be Air Marshal.—A. C. Stevens, C.B. (1st July, 1951).

Air Commodores (acting Air Vice-Marshals) to be Air Vice-Marshals (1st July, 1951).—R. B. Jordan, C.B., D.F.C., A.D.C.; N. S. Allinson, C.B.; G. D. Harvey, C.B.E., D.F.C.; A. D. Gillmore, C.B.E.; H. L. Patch, C.B.E.; J. R. Whitley, C.B., C.B.E., D.S.O., A.F.C.

TECHNICAL BRANCH. *Air Vice-Marshal (acting Air Marshal) to be Air Marshal.*—Sir Thomas A. Warne-Browne, K.B.E., C.B. (1st July, 1951).

MEDICAL BRANCH. *Air Commodore (acting Air Vice-Marshal) to be Air Vice-Marshal.*—J. S. Ewing, C.B.E., M.B., Ch.B., D.P.H. (1st July, 1951).

EDUCATION BRANCH. *Air Commodore to be Air Vice-Marshal.*—A. H. Robson, C.B., O.B.E., M.C. (1st April, 1951).

RETIREMENTS

Air Vice-Marshal G. A. H. Pidcock, C.B., C.B.E., is placed on the Retired List at his own request (23rd April, 1951).

Air Commodore G. G. Banting, C.B., C.B.E., is placed on the Retired List retaining the rank of Air Vice-Marshal (20th May, 1951).

Air Chief Marshal Sir W. Alec Coryton, K.C.B., K.B.E., M.V.O., D.F.C., is placed on the Retired List (24th May, 1951).

OPERATIONS

MALAYA

During the past three months air strikes on bandit concentration areas in Malaya have been stepped up very considerably both by day and by night.

In addition, Sunderland flying boats patrolled Malaya's coastline, and Mosquito and Spitfire reconnaissance aircraft carried out many photographic and other missions. The Malayan internal air ambulance services operated by the R.A.F. continued their routine flights between the principal airfields.

TRAINING

MANAGEMENT TRAINING.—Management training is now being included in the syllabi of all basic courses for both officers and airmen. The Officers' Advanced Training School has included this training in the course syllabus for some time. It will also be included in the syllabi of the Royal Air Force Staff College and the Senior Specialist course.

ANOTHER FLYING TRAINING GROUP REVIVED.—Further developments are taking place in expanding flying training. No. 54 Group, disbanded in June, 1946, has been re-formed, and its revival follows closely upon that of No. 25 Group in March last.

EXPANSION OF RHODESIAN TRAINING GROUP.—The Rhodesian Air Training Group is being reorganized to provide two pilot training schools instead of one as at present.

COASTAL COMMAND GOODWILL VISIT.—Four Sunderland flying boats of No. 201 Squadron left Pembroke Dock in July on a 10,000-mile training cruise and goodwill

flight lasting four weeks, to Iceland, Newfoundland, Bermuda, Jamaica and the United States. Squadron Leader P. A. S. Rumbold was in charge of the flight. This is the longest training cruise carried out by Coastal Command flying-boats since pre-war days.

DUNNING MEMORIAL CUP.—The Dunning Memorial Cup for the Royal Air Force Squadron achieving the highest standard on the Joint Anti-Submarine School Unit Training Course during the year has been awarded to No. 38 Squadron for 1950.

DESERT RESCUE EXERCISE.—A big desert rescue exercise, organized by No. 205 Group was recently carried out in the Suez Canal Zone.

AIRCREW TRAINING IN CANADA.—The third party of National Service aircrew, comprising 31 pilots and 23 navigators, has left England for training in Canada.

PERSONNEL

NEW TRADE STRUCTURE SCHEME.—The change over to the new trade structure scheme has been carried out smoothly and is now practically completed.

NATIONAL SERVICE MEN FOR AIRCREW.—It has been decided that there is no limit to the number of National Service men who may volunteer for training as aircrew. National Service aircrew now have the opportunity of extending their service by two years, making a total of four years.

NEW HAT FOR WOMEN'S ROYAL AIR FORCE.—The King has approved a new style of hat for wear by airwomen of the Women's Royal Air Force.

RESERVE FORCES

TRAINING OF AUXILIARY SQUADRONS.—Nine squadrons have now successfully completed three months' training. The remaining eleven squadrons were embodied for three months' training on 16th July.

COOPER TROPHY AIR RACE.—The Cooper Trophy air race for auxiliary squadrons, which was to have been held in June, has been cancelled owing to the three months' continuous training period which is being undertaken by squadrons this year.

VISIT BY MR. WINSTON CHURCHILL.—As Honorary Air Commodore of No. 615 (County of Surrey) Auxiliary Squadron, R.Aux.A.F., Mr. Winston Churchill recently visited this squadron at its base, Biggin Hill.

MATERIAL

FOUR-JET BOMBER AIRCRAFT

The first British four-engine jet bomber, the Vickers 660, made a successful maiden flight on 18th May. It is reported, to be powered by four Avon axial flow turbo-jet engines, each generating a maximum of 12,000 h.p. at 600 m.p.h. It has been announced by Vickers Armstrongs Ltd. that an order for a number of these aircraft has been placed for the R.A.F.

MISCELLANEOUS

PHOTOGRAPHIC OPERATIONS.—Photography of areas of 158,000 sq. miles of Nigeria and 32,000 sq. miles of the Gold Coast has been completed by No. 82 Squadron. These totals represent about 43 per cent. of the present task in West Africa.

FLYING BOAT DEPOT SHIP.—As part of the general expansion, it has been decided to take the " Adastral " out of reserve and complete its conversion as a flying boat depôt shop.

WOMEN PILOTS.—A flying branch has been created in the Women's Royal Air Force Volunteer Reserve to provide a reserve of women pilots for communication flying and ferrying duties.

GLIDING ASSOCIATION'S EXPEDITION TO FRANCE.—A Royal Air Force Gliding and

Soaring Association party recently visited St. Auban, in the French Lower Alps, where it carried out an investigation into standing waves. The leader was Group Captain G. J. C. Paul, D.F.C., Chairman of the Association, and the party took its own high-performance glider, a Weihe equipped with electrically operated blind-flying instruments and oxygen.

The objects of the visit, in which the Director of the Meteorological Office interested himself, were to do as much flying as possible in the famous standing wave at St. Auban, and to study French methods of research into the wave. The expedition was, in fact, a pointer to the rapidly growing interest in the mechanics of standing waves, as yet only imperfectly understood.

Unfortunately, only one full wave occurred during the visit, but the party carried out 35 hours' flying and heights of up to 17,000 feet were reached, including a certain amount of flying in fairly turbulent air. Many interesting aspects of gliding were studied, such as a funnel-shaped valley which deflected the wind upward in such a way that it was possible for the Weihe to remain at 6,500 feet for three hours, although there were no thermals and the nearest hill was several miles away.

On the day before the party arrived, the Chief Pilot of St. Auban and the holder of the present French altitude record both reached 26,000 feet in a wave. After getting into the wave—a difficult process—their rate of climb was 39 feet per second, dropping evenly to zero as the top of the wave was reached.

The French technique of wave flying was studied in detail, and much meteorological information on waves was obtained from the French meteorological officers stationed at St. Auban.

DOMINIONS AND COLONIES

CANADA

NEW AIR MEMBER IN ENGLAND.—Air Commodore M. Costello, Commander of the R.C.A.F. Tactical Group at Winnipeg for the past four years, has been appointed Air Member at the Canadian Joint Staff in London.

ORGANIZATION CHANGES.—The Minister of National Defence announced that the R.C.A.F. Air Defence Group was to be raised to Command status from 1st June. The new Command with headquarters at St. Hubert, P.Q. is commanded by Air Vice-Marshal C. R. Dunlap, C.B.E. Mr. Claxton also announced that the Tactical Group Headquarters at Winnipeg is to be moved to Edmonton and merged with North West Air Command Headquarters, the new headquarters to be known as Tactical Air Group Headquarters. At Winnipeg a training group headquarters will be formed to control and supervise the new training schools to be opened on the prairies.

Air Force Headquarters has announced the formation of a new technical training school at R.C.A.F. Station, Aylmer, Ontario, and the transfer of another ground training establishment there from Trenton, Ontario.

FIGHTER SQUADRONS FOR N.A.T.O.—On his return from Paris, where he conferred with the Chiefs of Air Staff of the United Kingdom, the United States and France, Air Marshal Curtis said that plans had been made for the dispatch overseas of additional fighter squadrons for the 11-squadron R.C.A.F. Air Division offered to N.A.T.O. No. 410 Fighter Squadron, which would be converted to F-86 Sabres, would move to the United Kingdom in the Autumn, and would be followed by two other fighter squadrons before the Summer of 1952.

R.C.A.F. MARITIME SQUADRON TRAINING WITH COASTAL COMMAND.—No. 405 Maritime Squadron has flown to England to carry out training exercises with Coastal Command.

NEW BOMBING AND GUNNERY RANGE.—A large bombing and gunnery range is being constructed 100 miles north-east of Edmonton. The range will cover an area of several thousand square miles.

NEW FIGHTER SQUADRON.—The formation of a new fighter squadron, No. 441, has been announced. It has been formed at St. Hubert, P.Q., and is being equipped for the time being with Vampire jet fighters.

CANADIAN JET ENGINE.—The Orenda, the first jet engine to be developed in Canada, has flown in the CF.100 all-weather fighter.

AUSTRALIA

OPERATIONS IN MALAYA.—The R.A.A.F. has co-operated with the R.A.F. during the past months in carrying out many attacks on bandit concentration areas. They also carried out extensive supply dropping operations from Kuala Lumpur.

CONVERSION TO JET AIRCRAFT.—Pilots of No. 77 Squadron, R.A.A.F., are carrying out conversion training in Japan to fly Meteor 8 jet fighters. They are being assisted by four officers of the R.A.F.

CITIZEN AIR FORCE SQUADRONS.—The Citizen Air Force Squadrons and University Squadrons will in future be known as Auxiliary Air Force Squadrons.

NEW ZEALAND

No. 41 TRANSPORT SQUADRON

A detachment of this squadron has been transferred from Singapore to Kuala Lumpur, where they have been co-operating with the R.A.F. and R.A.A.F. in supply dropping to troops fighting the bandits in Malaya.

SOUTH AFRICA

SQUADRON RE-EQUIPPED

No. 2 Squadron serving in Korea is being equipped with jet aircraft.

CEYLON

USE OF BRITISH TRAINER AIRCRAFT

The first of a number of De Havilland " Chipmunk " primary trainer aircraft have been delivered to Ceylon for use in building up the Singhalese Air Force. This type of aircraft is now in service with seven different countries.

The Prime Minister of Ceylon inaugurated the Ceylon Air Academy in November last year. The Academy is expected to own seven aircraft of which two are Czech types flown from Prague by British pilots.

HONG KONG

AUXILIARY AIR FORCE

Formed two years ago, in May, 1949, the Hong Kong Auxiliary Air Force is now at full strength and has a waiting list of over 100. It is an integral part of the Royal Hong Kong Defence Force.

FOREIGN

CZECHOSLOVAKIA

AIR FORCE RECRUITING

The Ministry of National Defence has announced a competition for the training as pilots of men doing military service. All those would be eligible who have graduated from an N.C.O.'s school with reasonably good marks and would not be over 24 by 1st April 1951. Applicants had to fulfil several requirements including membership of the Communist Party or the Youth Union.

A recruiting campaign has opened for candidates to join the Air Force Cadet Schools during the year 1951. Applicants must be between 17 and 20 and will be trained to become pilots, navigators, wireless operators or ground technicians in the Czechoslovak

Air Force. All persons accepted into cadet schools must agree to serve at least five years on a regular engagement after passing out.

It seems that attempts are being made to strengthen the Czechoslovak Air Force which has been reported as completely " run down " after a series of political purges.

FRANCE

U.S. Thunderjets for French Air Force

On 17th May, General Eisenhower handed over to the French Air Force 14 Thunderjet fighters at a ceremony at Rheims airfield. These aircraft were the first modern jet fighters to be delivered to France under the mutual aid agreement signed by the United States. They are to be followed by many more.

GERMANY

Ban on Gliding Removed

The ban on gliding in the Western Zone of Germany was removed during May. German pressure to obtain a relaxation of the ban had been increasing for some time and had the sympathetic support of the Federal Chancellor. The pressure was intensified following the formation in August, 1950, of the German Aero Club by Wolf Hirth, Klemperer, Hanna Reitsch, and other enthusiasts.

HOLLAND

Study of U.S.A.F. Organization

General Aler, the Dutch C.A.S., went to the United States for a three weeks' visit at the invitation of General Vandenburg. The purpose of the visit appeared to be a study of U.S.A.F. organization, training methods and air defence. He also visited Dutch pilots in training at U.S. bases.

A scheme to train Special Reservists of the Royal Netherlands Air Force was inaugurated at Twenthe Airfield recently. Only demobilized pilots who are earmarked for jet fighter squardrons in the event of war are eligible, and the training period is limited to four days every month.

ITALY

Fly-Past by Vampires.—At the Republic Day parade in Rome 27 British-built Vampires flew past. The remainder of the 200 aircraft taking part, almost the entire Italian Air Force, were obsolescent types, including Helldivers, Lightnings, Thunderbolts, and Mustangs.

Licence to Build Venoms.—A licence has been granted for Venom jet aircraft to be built in Italy.

JORDAN

R.A.F. Take Part in Manœuvres

Royal Air Force Vampire jet fighters and R.A.F. Regiment armoured cars took part in the recent Arab Legion desert manœuvres, the annual field exercise of Jordan's military forces.

The manœuvres, which lasted a week, enabled the Arab Legion regiments to gain experience in desert warfare while being both supported and harassed from the air, and gave the R.A.F. squadron experience of flying offensively against, and in support of, field forces.

While the Legion's Infantry, Artillery, and armoured cars, supported by armoured vehicles from the R.A.F. Regiment's Amman-based No. 4001 Flight, ranged in combat with a " shadow " enemy over the desert's wadi-ridden plains and bare hills South-East of Amman, the Jordan capital, jet-fighters from a Royal Air Force Squadron based in

the Suez Canal Zone alternately attacked and supported the moving columns. Operating from nearby Mafraq airfield, the Vampires made feint strafing attacks on the Legion forces, occasionally reversing their role to mount cannon and rocket attacks on positions where the " enemy " was believed to be entrenched. General Glubb Pasha, commander of the Legion, was with his troops when the R.A.F. jets " raked " them with cannon and rocket fire.

Before and after the manœuvres the Vampire squadron continued its normal rocket and cannon-firing practice on a range within sight of Mafraq.

Excessively bad weather, with persistent high winds raising clouds of sand and reducing visibility to zero, prevented the late King Abdullah, who was a honorary Air Commodore in the R.A.F., from making his planned visit to the squadron.

PERSIA

Training Course in England

Fifty Persian Air Force officers and men, after finishing a training course in England, have recently returned to Persia.

RUSSIA

Air Display

Marshal Stalin attended an air display of 480 aircraft at Moscow's Tuschino airfield in honour of Soviet Aviation Day. The display ended with a mass parachute drop by Soviet airmen and women from 36 airliners.

SWEDEN

Search and Rescue

The Search and Rescue flight of the Swedish Air Force is located at Hagernas, eight miles N.N.E. of Stockholm, and is equipped with amphibian aircraft (Catalinas) and seaplanes. In addition, aircraft of the Air Force ambulance flight are stationed at Hagernas, Boden, and Ostersund for medical transport duties. One aircraft is kept permanently at an hour's notice.

The Rescue Co-ordination Centre for civil aviation is at Bromma airport, Stockholm, and liaison is maintained with the air safety service of the Air Force. There are in addition well organized civil sea and land rescue units throughout Sweden. Some 30 motor lifeboats of various types are available around the coast, and land units, equipped with " snow-amphibians ", are stationed in the mountains. Both co-operate with the Air Rescue Services as necessary.

TURKEY

Use of Jet Fighters

The Turkish General Staff worked out plans to acquire jet fighters for the modernization of its Air Force some time ago.

It is believed that Turkey will receive 100 jet fighters under the American Military Aid programme. A number of Turkish pilots are to be trained in America, and airfields at Ankara, Istanbul, Adana, Diyarbekir, and Erzincan are being enlarged and refitted to accommodate jet aircraft.

UNITED STATES

U.S. Air Arm in Britain.—General Eisenhower's headquarters in Paris has announced that the United States 3rd Air Division based in the United Kingdom had been raised to the status of an air force—the United States 3rd Air Force. It was announced from Washington that a new air division, the United States 7th Air Division, has been formed and will be established in Britain.

The 3rd Air Force will be commanded by Major-General Leon W. Johnson, who has been in command of the 3rd Air Division, and the 7th Air Division will be commanded by Major-General Archie J. Old.

The higher status accorded to the 3rd Air Force is a recognition of its growing size and importance. A new air division in the United Kingdom has been created to relieve General Johnson of some of his responsibilities and to take over the operational control of American bomber and fighter units which visit this Country for training periods of three months on a rotational basis. General Old's organization will be responsible for the American maintenance and supply bases in Britain, as well as for certain former R.A.F. stations. These airfields are now being improved to fit them for use by B29 and B50 Superfortresses. The 7th Air Division will also assume responsibility for a new airfield which is to be built.

General Johnson, the senior United States Air Force officer in the United Kingdom, will have the overall command of United States air units in this Country, but will be concerned mainly with administrative and liaison duties.

CANBERRA TO REPLACE U.S. JET BOMBER.—It has been announced that the United States Air Force has ceased production of B45 jet bombers in favour of the British Canberra.

NEW AIR BASES IN MIDDLE EAST.—The United States has signed a five-year agreement with Saudi Arabia for the use of Dhahran airfield which the Americans helped to build during the war.

YUGOSLAVIA

WORLD PARACHUTING CHAMPIONSHIP

A special commission of the Sports Flying Association has devised a programm of events for the World Parachuting Championship to be held near Bled in July. The events include :—

Jumping into circles of radius 100, 200 and 300 metres.

Falling free from 2,000 metres and opening parachutes at 500 metres.

Jumping from 300 metres into water, getting free of the parachute while still in the air and swimming to a fixed goal.

REVIEWS OF BOOKS

GENERAL

A Short History of World War I. Compiled by Brigadier-General Sir James Edmonds, K.C.B., C.M.G. (Oxford University Press.) 30s.

The object of this work is to provide a summary for the general reader and an introduction to the study of the land operations of the War for the military student. It is written by the official historian, who served for the major part of the War on the staff of G.H.Q. and has since had access to the relevant documents.

The main narrative is based on the Western Front; events at sea, on the Eastern Front, in Italy, the Balkans, Gallipoli, and the Caucasus are interpolated, year by year, with connecting references. The narrative is easy to follow, gives an account of operations not readily accessible to the ordinary reader or military student, and outlines the development of the air forces. Mesopotamia and Egypt/Palestine are placed among the "side shows" at the end of the book, each campaign compressed into one chapter; that dealing with the latter consisting of seven pages in a volume of about 450. Whatever may be the final judgment on the effect of the operations in Palestine on the grand strategy of the War, it is a fact that they proved rich in illustrations of the application of the principles of war. Surely the worst "side show" was in Macedonia, where for three years large forces occupied what the Germans called the "Allied concentration camp." The author has no doubts as to the folly of this detachment, and gives reasons for his opinion. The incident should be compared with our expedition to Greece in 1941.

In the first chapter are some apposite comments on command, and the organization, training and equipment of our forces. The author reminds us that the old Regular Army was practically expended by the end of 1914, and that we carried on the War mainly with amateurs. After a commendably brief account of how the War came about, the narrative states the forces available to both sides and outlines their respective plans. The German failure on the Western Front is graphically described, and the author points out: "that to account for their failure, the German General Staff invented the legend that Moltke had not in 1914 followed the Schlieffen plan of 1905, of simple envelopment in the West; they concealed the fact, until it was revealed after Hitler came into power, that in 1912, on Schlieffen's advice, the plan had been changed to the form adopted." Falkenhayn did not succeed in resurrecting the original plan to sweep round the Allies' left; his attempt ended in "the race to the sea," the deadlock in Flanders, and no open flanks.

Tremendous propaganda value to the Hindenburg/Ludendorff combination accrued from the battles in East Prussia. But, as the author points out, the preliminary movements leading to the battle of Tannenburg had been initiated before they arrived, and the extent of the success was largely due to the initiative and determination of a corps commander. They were also lucky; the Russians sent out their operation instructions by wireless in clear. The Austrians were soon in trouble, and badly beaten about Lemberg. The hasty German offensive in Poland relieved the pressure, but failed to achieve "the victory of annihilation," and the situation remained so critical that Falkenhayn decided to make the main effort in 1915 against Russia. Thus the Allies in the West were given time.

The year 1915 was a black one for the Allies. Failures on the Western Front caused much disappointment, as did Macedonia and the unsuccessful campaign in Gallipoli—which is very briefly described. On the Eastern Front, the Austro/Germans broke through at Gorlice-Tarnow, a victory which was exploited to the full. Serbia was occupied, the German object being to open communications with Turkey.

The narrative contains a lucid summary of the events of each year after 1914, of the plans proposed by both sides, and brief commentaries follow after the description of the various phases. The long deadlock on the Western Front and the various efforts

to break it are put in the right perspective. The author points out that the enemy losses on the Somme were such that it became known as " the muddy graveyard of the Army," for there they lost the trained leaders and men who could not be replaced. The factors affecting Haig's decision to mount an offensive in Flanders in the late Summer of 1917 are clearly stated; also, that one reason for its continuance into the Autumn was that the French Army had not yet recovered from the mutinies.

The story of the operations in 1918 is interesting and instructive. Haig suffered from the stupidity of politicians and the behaviour of Pétain. But, once more, in spite of inadequate means, the B.E.F. staved off disaster, and then played a major role in the last offensive. These final operations took the form of frontal advances and hard fighting; no Napoleonic mass of manœuvre appeared to deal a shattering blow.

One short chapter gives a narrative of the operations against the German Colonies, mostly in Africa. The West African Frontier Force is unfortunately described as the " West African Rifles."

The final chapter, " Retrospect," contains some admirable comments on strategy, tactics, man-power, material; and refers to the erroneous deductions drawn by superficial observers as to the power of defence. An outstanding lesson, which the author believes has special significance for the future, is the confirmation of Butler's lines: " Twice is he blest who has the quarrel just, but three times he who gets his blow in first."

The narrative is supplemented by notes and ample, clear, well-placed maps, also with potted biographies of the principal commanders and chiefs of staff. This work, which contains a vast amount of information, is recommended as a valuable introduction to the study of land warfare in the 1914–18 War. It should be read reflectively by officers before proceeding to study any particular campaign in detail.

Scientists at War. By Wilfred Eggleston. (Oxford University Press, Toronto, Canada.) 28s.

Scientists at War is the story of Canada's war effort in the scientific field. It covers the development of radar, the proximity fuze, RDX explosives, atomic energy, land, sea, and air technological developments, medical research, and the achievements in the production of essential commodities and foods.

It really covers a wider field than the North American Continent, for it portrays the whole of the Western Allies' scientific achievements. It gives credit to Britain where credit is due, and shows that Britain in many cases was the leader, and Canada and the United States eager to learn her secrets. In fact, many of the little advertised aspects of reverse lease-lend are portrayed throughout the narrative.

Although some of the book is tedious, yet understandable to the unscientific layman, many passages are of great interest. One of these is Operation Habakkuk, which is described as *"Fabulous Floating Islands of Ice."*

" I do not, of course, know anything about the physical properties of a lozenge of ice 5,000 ft. by 2,000 ft. by 100 ft." wrote Winston Churchill, " or how it resists particular stresses, or what would happen to an iceberg of this size in rough Atlantic weather, or how it would melt in different waters at different periods of the year. The advantages of a floating island or islands . . . are . . . dazzling." . . .

This monumental project was eventually defeated by the economic, not the scientific obstacles, for as the programme progressed it became apparent that to build a serviceable ice-island would be as big and slow and costly an undertaking as to build an orthodox aircraft carrier of steel. Yet new data was acquired concerning the nature and behaviour of ice, and the production of new materials by mixing it with other substances.

As one reads through the book one realizes more than ever before how vital was the Battle of the Atlantic, and how much Canada contributed to the winning of it. Measures and countermeasures in scientific warfare gave the advantage first to one side

then to the other throughout the War. To render impotent the German magnetic mine, the Allies produced depolarizing cables: the Germans countered with the invention of acoustic mine. The Allies responded with noise-making devices for minesweepers. The enemy's ultra-sonic acoustic mines in their turn were baffled by suitable countermeasures. Thus it is a story of an international game of military chess, with the Allies blocking one move of the German opponent while trying to foresee the next.

The pages of the book also reveal many things unknown to service men who have not served in the Far East. Tropical deterioration was apparently a great problem. One reads with amazement of moulds that grow up and hide your boots overnight, of uniforms rotted to the point of uselessness in a week, of cork plugs rapidly falling apart, of fungi which readily attacked the varnishes, lacquers, and other coatings applied to equipment to protect it against moisture corrosion. But the scientists somehow produced the antidote.

It is a book primarily intended for the layman who is interested in scientific development. It is well worth reading, and shows that at the present moment Canadian research is gaining an international reputation for the quality and efficiency of its accomplishments.

Military Science To-Day. Third Edition. By Donald Portway. (Oxford University. Press.) 7s. 6d.

This book is one of a series called "The Pageant of Progress," wherein the evolution of various human activities has been studied in a popular or lightly technical manner. Earlier editions were written just before and during the late War. This last edition gives the impression of having borrowed rather too liberally from its predecessors, sometimes without adequate discrimination.

Too much of the limited space (173 pages) is occupied, for example, with detailed descriptions of technical methods of the 1914–18 War. There may be interest for historians or archæologists in the machinery of past wars, but in these respects the lay-out of line communications in the Ypres sector of 1915 (which is given a full page diagram and some letter-press) is really of no greater interest than the lay-out of an ancient British fort!

It is perhaps only natural that the author should give us a more detailed insight into activities wherein he himself was once involved than into the technique of other arms. It is easy to guess that the author (a sapper officer) dabbled in turn with sound ranging, field engineering, signals work, and perhaps also chemical warfare and radar. For all that, however, one might expect, in a work that aspires to be scientific, a slightly keener sense of proportion in what should be included and what omitted. It is rather disconcerting, for instance, for a gunner to find in the chapter on "Artillery Today" no mention at all of hollow-charge projectiles or non-recoil guns, even though space has been found elsewhere for the intriguing but surely less important fact that one must not fill a beer-bottle too full if one wants it to burst when thrown from an aeroplane!

There are about 30 excellent photographs, mostly of equipment used in the 1939–45 War. Even here, however, there are traces of lack of revision. The letter-press references to Plate 25, for example, are really intended for Plate 26 and *vice-versa*.

Apart from these minor faults the book is pleasant and easy to read. There are cheerful flashes of humour—for example the paragraph on the gas called B.B.C. No reader need fear immersion in incomprehensible scientific jargon. Even the chapter on the atomic bomb is worded so simply and clearly that few will have difficulty in following it. Every soldier will add something to his military knowledge by a perusal of this book. It has a short but adequate index.

Cloud Physics. By D. W. Perrie. (University of Toronto Press.) 32s.

" To the casual observer, a cloud appears to be a mass or group of masses of some visible substance, floating in the air above the earth. A cloud is, however, made up of an aggregation of a great number of very small ' elements'. These ' elements ' are water droplets or ice crystals, or a mixture of water droplets and ice crystals."

With these opening remarks the author, who is a distinguished meteorologist with the British Columbia Forestry Service, proceeds straightaway to classify and name the various types of clouds—a process which, for the layman, is much assisted by a series of remarkable and beautiful photographs. He then goes on to describe the various processes which lead to the formation of clouds, and to analyse the elements of which they are composed.

An interesting chapter is devoted to the various theories propounded as to the exact nature of the nuclei around which the elements are formed. While agreeing that there is much to favour the theory that these are derived from minute salt particles drawn from the sea, Mr. Perrie appears to favour the supposition that they are derived from dust particles of cosmic origin.

After discussing the natural causes of the precipitation of rain, snow, and hail from cloud, he summarizes, all too briefly, the experiments carried out by himself and other physicist-meteorologists in Canada, U.S.A., and Australia to create rain artificially by " seeding " clouds with dry ice from aircraft, and draws the conclusion that in the present state of this experiment it is too early to assess the practical significance of this new science.

The concluding chapters deal with the methods of observation of clouds, their relation to meteorological forecasting, and the influence of clouds on flying.

There is also a brief account of stratospheric clouds and the optical and electrical phenomena associated with clouds. To meteorologists, who view clouds as a professional tool ; to aviators, who must fly amongst or through them ; and to water-supply engineers, who have now begun to investigate the practicability of making them yield rain to order ; this work should prove a valuable text-book. Others, who merely look at clouds to judge the weather or to enjoy their beauty, may find much of interest and pleasure in the less scientific portions of it. Professor Charles F. Brooks of Harvard University contributes a foreword. There is a complete bibliography for the scientific reader and a helpful glossary of technical terms for the layman.

Dance of Death. By Erich Kern (Collins.) 10s. 6d.

The author, apparently a journalist in civil life, fought with the German armies throughout the campaign against Russia from 1941 until the final defeat of the Central Powers. His book, however, is in no way any sort of history of that campaign, but rather a reflection of his own thoughts and feelings, interspersed with snatches of action, general moralizing on the situation, and a somewhat morbid introspection.

Somehow, the last part of the book, in which Mr. Kern discusses his thoughts and conversations while a prisoner of war of the Americans after the surrender, does not quite ring true. It has been, one suspects, coloured and modified by post-war events and what was written as a sort of prophecy is really no more than an intelligent use of of later knowledge. Yet typically German is the deep-seated belief that the war in the East was lost by a mistaken policy and that the National Socialist cause, which committed so many atrocities on the conquered Russian people, is to be blamed only for the folly of that decision, and not from any inherent wickedness of its own.

Nevertheless, the book holds the interest of the reader to the end, even though there is that suspicion of falsity in the closing chapters. The revelation of the German character is extremely convincing in its search for an excuse, in its belief in bad leader-

ship, in anything, in fact, which can possibly explain away the reality of defeat. That is, after all, a very typical German characteristic, as is also a belief that, in immolation and suffering, the German soul can be recreated to become once again the *Herrenvolk*. Yet, in spite of the introspection, in spite of the compromise by which Mr. Kern, and other Germans, can lull their consciences into accepting wrong as right, the author has written an extremely interesting book. It can be confidently recommended as a serious document which reveals, in part, the typical German mind at work.

NAVAL

Nine Vanguards. By Lieutenant-Commander P. K. Kemp, R.N. (Hutchinson & Co.) 18s.

On a bleak November day in 1944 H.R.H. Princess Elizabeth launched the ninth and latest British "Vanguard" to the cheers of those who were building her. In this book Commander Kemp tells the story of this great vessel and of the eight "Vanguards" which preceded her.

In the year 1586 was launched the first of the "Vanguards," a vessel of 500 tons. Two years later she was in the thick of the fighting at Gravelines against the ill-fated Spanish Armada and she played a great part in Howard's attack on the new Armada at Cadiz in 1596. When she was scrapped in 1630 her timbers were used for a new and larger "Vanguard."

The author devotes six chapters, Chapters III to VIII, to the second "Vanguard," which "rose, Phoenix-like, from the ruins of the first." During her long career this famous ship added seven battle honours to the "Vanguard" roll, all fought gallantly and hard. Hers was a proud record, for in all the savage battles against the Dutch she was in the hottest part of the fight. Her long career ended tragically in 1667, when she was needlessly scuttled as a blockship below Rochester Bridge against de Ruyter's squadrons, but by then she had laid a worthy foundation on which the long line of future "Vanguards" could build their trail of glory. With her the "Vanguard" tradition, begun in the year of the Armada, was firmly established.

Chapter IX tell the story of the third "Vanguard," a ship of 1,357 tons, launched in 1678, which fought against the French at the battle of Barfleur in 1692, and thus added another name to the "Vanguard" battle honours. She was renamed "Duke" in 1723.

The fourth ship of the "Vanguard" line was built at Cowes between 1752 and 1756 in time for the Seven Years War, that great conflict which, between 1756 and 1762, set the future pattern of the British Empire and finally wrested sea power from France. She was sold out of the Service in 1774.

Although the name "Vanguard" was given to a small vessel in 1780, another "Vanguard," built in Deptford in 1787, is generally recognized as fifth of the line. This ship, the most famous of the "Vanguards," fought in the Napoleonic wars and added the Nile to the growing list of "Vanguard" battle honours.

The story of the sixth "Vanguard," told in Chapter XVII, though long in years is almost completely devoid of action. Launched in 1835 she was renamed "Ajax" in 1867, a change of name necessitated by the building of a seventh "Vanguard," the first of the name propelled by steam. Her career was short for in 1875 she was sunk in collision with a sister ship, the "Iron Duke," off the Wicklow coast, fortunately without loss of life.

Thirty years passed before another "Vanguard" appeared in the Navy List. This vessel, a "Dreadnought" of 19,250 tons and mounting ten 12-inch guns, fought at Jutland in 1916. She came safely through the action but on a summer night 14 months later blew up without warning with heavy loss of life whilst anchored with the Grand Fleet in Scapa Flow.

A quarter of a century later the ninth and present "Vanguard" was under

construction. This is the great ship which carried the Royal Family to South Africa in 1947 and which today remains the mightiest warship in the Royal Navy.

Space here permits little more than a brief mention of each " Vanguard " in turn, but Commander Kemp's book, which is well written, illustrated and indexed, is much more than a mere description of nine British warships. It is clearly based on extensive research, and is well documented, but it hardly justifies its claim to " present a new experiment in British naval history."

ARMY

The Story of Aldershot. By Lieut.-Colonel N. Cole, O.B.E., T.D. (Gale and Polden, Ltd.) 30s.

When a place has grown in less than 100 years from an obscure hamlet into a town whose name must be famous in most parts of the World, the history of how this happened cannot fail to be interesting, particularly to those who may claim to have had some corporate share in the achievement. It was the British Army to which this credit must fall in the metamorphosis of Aldershot. Therefore, next to loyal citizens of that borough, it will be British soldiers who are most likely to find interest in Colonel Cole's book.

The author, a keen burgher of Aldershot, has undertaken a task which is obviously near to his heart with inspiring zeal, and with an apparently inexhaustible determination to get all his facts correct. All through his book there is evidence of most meticulous research into all available records. Apart, therefore, from its immediate interest to the reader, this book will be of value as a reliable work of reference, which indeed all good histories should be, but not always are.

As regards Aldershot, there may be said to be two distinct types of British soldier—those who have spent a large portion of their service there and those who have not. To the former this book will no doubt offer many nostalgic memories. As one of the latter I can affirm that it is worth reading, even by those who may owe prior allegiance to " Pindi," Poona, Peshawar, or any other outlandish cantonment. Wherever they have spent their service, all British soldiers must have absorbed something of that outlook which foreign military observers, with a mixture of disdain and envy, have been known to describe as the " Aldershot mentality." It may well have been the British Army that produced Aldershot. It is equally true that the great " Camp," with its proximity to London and with the keen interest taken by Royalty in its activities, produced the spirit of Mons and Le Cateau—a spirit still to be found in Korea today. This book shows how this happened.

Though we no longer combine ceremonial review order with manœuvres in one gruelling field day, as was the fashion at Aldershot nearly 100 years ago, we still believe that the best kind of fighting man takes some pride in " spit and polish." That was the spirit that made Aldershot. It is the same spirit that has helped British fighting men to stick it out in many an awkward corner.

Numerous excellent photographs add value to the book as an historical record. Particularly illuminating are two of these—the first motor car owned by the British Army in 1902, and the departure of Artillery horses in 1936.

Khaki and Gown. By Field-Marshal Lord Birdwood. (Ward Lock and Co.) 25s.

The death in May of Field-Marshal Lord Birdwood, of Anzac and Totnes, draws attention to this autobiography, first published in 1941. Mr. Winston Churchill contributes a foreword, in which he writes, " the book will be read by the older officers of the Army with delight, reminding them of the ' good old days,' and many young officers should also read and learn of the doings of their fathers in sport and in war." It is suggested, in fact, that it can be studied with the greatest profit by a wider circle, for Lord Birdwood, in the course of a very varied military career, encountered and solved with outstanding success all those perennial problems of command responsibility

and the exercise of authority which will continue to confront serving officers as long as British armies exist.

It is, perhaps, possible to select the most significant incidents in a career, every step of which appears in retrospect to have been providentially designed to prepare him for the next. He was adjutant of a fine Indian Cavalry regiment, 11th Bengal Lancers, now Probyn's Horse; in the South African War he was Brigade Major of Dundonald's Mounted Brigade, which included several irregular, but most effective, colonial contingents. He was Chief Staff Officer of the Mohmand Field Force in 1908, and makes a comment which shows the truth of the principle that it is the good regimental officer who makes the best staff officer. . . . "I made a point of keeping up the closest possible relations with the various fighting units . . . and trying to let the troops realise that the General they served was ever mindful of their well-being and safety . . . this is the right way to set to work, for it is the human factor—the man behind the gun—that counts, first and last." After nine years on Lord Kitchener's staff as Assistant Military Secretary and Military Secretary, he spent four years in command of the Kohat Independent Brigade on the North-West Frontier.

His most brilliant success came as Commander of the Anzac Corps in Egypt, Gallipoli, and France in 1914–18, of whom he says, "I found no difficulty in establishing the friendliest relations with them in a very short space of time," and later, "I went among the men as a stranger, yet from the first they accepted me almost as a brother. When, after the war, I visited Australia, one of the first objects to meet my eye on landing at Fremantle was a poster depicting a huge hand—the hand of one of my Diggers . . . with the words: "Put it right there, Birdie!"

Lord Birdwood retired in 1930, after five years as Commander-in-Chief, India. He thereupon received what must have been the most unexpected appointment of his life—one, indeed, unique for a soldier, however distinguished—as Master of Peterhouse, the oldest college in Cambridge. Once again, his genius for friendship, combined with an enviable mental alertness and flexibility, made his tenure of the Mastership a happy and successful one.

Of the many pleasing stories which enliven the book, none is more delightful than that which tells of his installation of "eighteen good bathrooms" at Peterhouse, and the comment thereon of "one of the real old inhabitants."

The whole book is an inspiring and readable account of a life of duty and service of which, one feels, the author wasted not a minute and enjoyed every one.

Regimental Badges. By Major T. J. Edwards, M.B.E., F.R.Hist.S. (Gale and Polden, Ltd.) 15s.

General readers, no less than military historians, should welcome the publication of Major Edwards's book, for in it is set out, in considerable detail, the evolution and the individual history of every regimental cap badge in the Army. His book is a mine of information, tracing not only the history of, and the reasons for, the badge as such, but also the evolution of the headdress on which the badge is worn.

This is a fully comprehensive collection, with exceptionally clear illustrations, and gives, in addition to present badges, those which were worn by regiments until they changed their role and adopted the badge of their new Corps. As such, this is an invaluable book of reference for the military historian, and must also be a source of great interest and pleasure to those who take a pride in the history and traditions of the Army. It is very well produced and quite remarkable value for its price.

The Fourth Division 1935 to 1945. By Hugh Williamson. (Newman Neamé, Ltd., 29, Percy Street, W.1.) 15s.

The divisional history, though intended primarily for those who served in the formation, has a place of its own in our records of military achievement, for the division is the

smallest formation which comprises practically all arms of the service. So the accounts of the division in action give, or should give, a working idea of how a modern army conducts its operations. The 4th Division—" a great fighting division " Viscount Alexander calls it in his foreword—was a typical product of the Regular Army and, despite some vicissitudes in reorganization, preserved its character throughout the War. The first chapter of the story ends with Dunkirk, the losses of the 4th in the 1940 campaign being given as about fifty per cent. of the fighting troops ; then follows over two years of training at home, hard fighting in Tunisia before the Axis surrender in Africa, and Italy from February 1944, before the fall of Rome, until the end. As an aftermath comes duty in Greece where the British soldier performed so well his traditional role of international policeman.

The author complains that much that would be of value is not to be found in the war diaries of the units and formations concerned. Such has always been the case, the incidents which lend life and interest to a recital of active service existence having to be sought elsewhere. But Mr. Williamson has done very well. He finds himself committed to a " tactical history," the story developing into one of Infantry in action for it is only occasionally that the other arms dominate the scene. Although he apologizes for neglecting to do so, he does describe the " character of the countryside," the state of the weather, and other matters which enable people who fought in the Division to recall the occasion and, to some extent, relive their experience. Moreover, he shows that we were so unready for war in 1939 that even a Regular division lacked battle training and modern equipment ; and he gives a good description of conditions in France before the German attack in 1940.

Perhaps those of all ranks—there are many of them—who won honours and awards might have been mentioned by name, and the casualties suffered more exactly recorded. It is said that during the Italian campaign the infantry battalions of the Division suffered nearly 100 per cent. of their total strength in killed, wounded, and missing.

There is a sketch map to illustrate each of the principal actions ; and the pictures, almost without exception, are reproduced from actual photographs of troops of the Division in Tunisia and Italy. A word of praise is due for the clever little head and tail pieces provided for the chapters by Major Gneditch ; and the distinctive format proclaims a proper divisional pride in the details of production. It should be mentioned that the book is only obtainable direct from the publisher.

Ninth Queen's Royal Lancers, 1936–1945. Edited by Joan Bright, O.B.E. (Gale & Polden, Ltd.) £3 3s.

This book, the sub-title of which is " The Story of an Armoured Regiment in Battle," contains 359 absorbing pages.

As a unit of the 1st Armoured Division, the 9th Queen's Royal Lancers took part in the Campaign in France in 1940, returning to England on 17th June after embarking at Brest. Following a period of refitting and training at home, and after a two-month voyage from the Clyde, they disembarked at Suez at the end of November, 1941.

Then followed the exploits of the Regiment in the Desert ; in the actions at Knightsbridge, " the Cauldron," Ruweisat Ridge, the Battle of Alamein and the subsequent pursuit until, in Tunisia, it took part in the left hook which enabled the Eighth Army to break through the Mareth Line. After a period with the First Army in the final stages of the North African campaign it moved back to the Desert and then, via Tunisia again, to Algiers whence, in May, 1944, it embarked for Italy.

It was in Italy that, in September, 1944, the 1st Armoured Division was broken up and " the White Rhino was handed down to the 2nd Independent Armoured Brigade, to whom it had originally belonged." It was in Italy too that, when ordered to hold part of the winter line as infantry, the Regiment christened itself " The 86th Regiment of Foot "—eighty-six having been its divisional serial number since 1941. The Regiment served in Italy for the rest of the War and supported many infantry brigades in action until, on 25th April, 1945, it reached the River Po.

This excellent history, which is profusely illustrated, contains a number of well-placed pull-out maps and ten appendices which include the Roll of Honour, a list of honours and awards, and much other useful information. It is well indexed.

History of the 2nd Canadian Battalion. By Colonel W. W. Murray, O.B.E., M.C. (Mortimer Ltd., Ottawa.) Available in certain libraries only.

After reading this little book, which so vividly describes many of the scenes of the fighting in France during the 1914–18 War, one is left with the impression that, at considerable cost, the 2nd Canadian Battalion built up fine traditions of service and comradeship. It would thus appear surprising that it was not represented by any unit in the Canadian Forces in the 1939–45 War.

This account of the battles and actions in which they were engaged has been compiled by one of their own officers, who was wounded, blown up, and gassed, sharing in fact the normal life of a front line soldier for more than three years. He has made no attempt to paint the wider picture and his story, told in an easily readable narrative form, records the triumphs and disasters of the Battalion from the gas attack at Ypres in April, 1915, to the crossing of the Canal du Nord in September, 1918. Written at the request, and for the benefit, of those who have survived, his book will serve as a worthy memorial to all those engaged in the operations referred to, during the course of which the Battalion won two V.Cs.

One of the days to which they can all look back with pride was the 9th September, 1916, when they stormed Pozières Ridge, for on this occasion they won the applause so rarely given by one group of soldiers to another. As they marched back after relief they were cheered by the other troops lining the roadside, who were quick to realize that they had carried out an unusual feat most gallantly.

Those readers, who endured with them the stress of these years, will find much to remind them of the glory of the Somme, with its terrible casualty lists, and of Third Ypres, with its appalling conditions, which saw the ruination of many a fine unit. Many of the incidents so faithfully recorded depict the scenes which were so common in the fighting in France, the barrage, the short dash across " No Man's Land," the bombing to clear the captured trench, and the inevitable counter-attack which followed.

The sketch maps included are clear and adequate and the book contains the usual lists of casualities suffered and honours won.

AIR

The Wonder Book of the R.A.F. (Ward, Lock and Co., Ltd.) 12s. 6d.

This book is one of a series " for boys and girls of all ages," of which the 20 books include volumes on the Navy and Army, ships and railways, motors and electricity, and reference books which endeavour to answer Kipling's questions—the six honest serving men whose names were What and Why and When, and How and Where and Who.

The unnamed author is to be congratulated on having produced a book which will be of interest, not only to boys and girls, but to young men and women who think of entering the R.A.F. or one of its auxiliaries. This is the age of jet and radar, as Sir Charles Longcroft points out, but many old hands from the R.F.C. and R.A.F. will take pleasure in viewing again the illustrations of the Vickers Gun-Bus, the Blackburn Kangaroo, the Handley-Page 0/400, the Bristol Fighter and Sopwith Snipe.

There is a chapter on the Battle of Britain, with a full-page picture of the Memorial Window in Westminster Abbey ; and pictures of the Hawker Hurricane and Supermarine Spitfire, the Consolidated Catalina and Short Sunderland, the Bristol Beaufighter and Fairey Firefly, the Avro 504 and de Havilland Tiger Moth, with scores of others. Their names are music to the men and women of the R.A.F. and history to all others.

The remaining 75 per cent. of the book is ultra-modern in its descriptions and

illustrations of gas turbines, nowadays styled jet and prop-jet ; a comprehensive outline of the technical details of a modern war-plane ; illustrations of cockpits, with every instrument identified ; the internal construction of instruments, and methods of finding the way by day or dark. A whole chapter is devoted to radio and radar—" the days of the aeroplane which is deaf, dumb, and blind are numbered." The chapter explains the mysteries of VHF and H2S, blips and displays, pulse and time-base.

There are illustrations of the Gloster Meteor, the most powerful single-seat fighter in the World ; the de Havilland Vampire and Venom ; the Hawker P.1052 and the Vickers S.510 ; jet engines like the Rolls-Royce Nene, de Havilland Ghost, and Armstrong-Siddeley Sapphire ; turbo-props like the Armstrong-Siddeley Python, the Bristol Theseus and Double Proteus.

About half the book deals attractively with life in the R.A.F., from boy entrant, straight from school, or aircraft apprentice, to technical tradesman, or air crew, cadetship, commission, pilot, instructor, test pilot. In a chapter on the work of the Women's Royal Air Force, citations are quoted from the hundred decorations, including the George Cross, and the thousands of " Mentions in Despatches " earned by these gallant and enterprising young women.

There have been slight changes in rank and other badges of aircraftmen and non-commissioned officers since page 193 was printed, but in two points the book is in advance of the event : on page 70 reference is made to British jet bombers, and since the book was printed one of them, a Vickers 666 with four jets, has flown ; and on page 93, it says " only the rashest among us would rule out the atomic aero-engine as impracticable." American experiments, made under the project styled N.E.P.A.—nuclear energy for the propulsion of aircraft—have been in hand for about four years, though only recently announced.

This is a book which will settle many arguments. It is admitted that young people can manage without an index, but old pilots, those of us who are in process of fading away, might need one.

ADDITIONS TO THE LIBRARY

(*Books for Reference in the Library only)

GENERAL

A Short History of World War I. Compiled by Brigadier-General Sir James E. Edmonds. Demy 8vo. 454 pages. (Oxford University Press, 1951.) 30s. Presented by the Publishers. (See Review in this Journal.)

Generals and Politicians. Conflict between France's High Command, Parliament and Government, 1914–1918. By Jere Clemens King. Demy 8vo. 294 pages. (University of California Press, 1951.) $3.50.

History of The Second World War. United Kingdom Civil Series. Problems of Social Policy. By Richard M. Titmuss. Medium 8vo. 596 pages. (H.M.S.O., 1950.) 25s.

History of The Second World War. United Kingdom Civil Series. Coal. By W. H. B. Court. Medium 8vo. 422 pages. (H.M.S.O., 1951.) 21s.

History of The Second World War. United Kingdom Civil Series. Statistical Digest of the War. Prepared in the Central Statistical Office. Crown 4to. 248 pages. (H.M.S.O., 1951.) 32s. 6d.

Scientists at War. By Wilfrid Eggleston. Demy 8vo. 291 pages. (Oxford University Press, 1950.) 28s. Presented by the Publishers. (See Review in this Journal.)

Military Science To-day. By Colonel Donald Portway. Demy 8vo. 175 pages. (Oxford University Press, Third Edition, 1951.) 7s. 6d. Presented by the Publishers. (See Review in this Journal.)

The Hell Bomb. By William L. Laurence. Crown 8vo. 198 pages. (Hollis & Carter, 1951.) 9s. 6d.

Cloud Physics. By D. W. Perrie. Royal 8vo. 119 pages. (University of Toronto Press, 1950.) 32s. Presented by the Publishers. (See Review in this Journal.)

Documents on British Foreign Policy, 1919–1939. Third Series. Volume IV. 1939. Edited by E. L. Woodward and Rohan Butler assisted by Margaret Lambert. Medium 8vo. 647 pages. (H.M.S.O., 1951.) 35s.

Everyman's United Nations. A Ready Reference to the Structure, Functions and Work of the United Nations and its Related Agencies. Demy 8vo. 313 pages. (United Nations, Department of Public Information, New York, Second Edition, 1950.) 9s.

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